Quality Air Force Symposium • • •

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Shaping the Future

19960501 098

October 11-14, 1994

Montgomery Civic Center Montgomery, Alabama

Sponsored by the Air Force Quality Council Hosted by the Air Force Quality Institute

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Approved to: Description





PROCEEDINGS

DRAFT SF 298

1. Report Date (dd-mm-yy Oct 1994		eport Type iposium Proceedir	ngs	3. Dates covered (from to) 1994					
4. Title & subtitle Proceedings - Quality Air	ymposium 1994		5a. Contract or Grant # None						
Shaping the Future		5b. Program Element # None							
6. Author(s) Various Authors	**		5c. Project # None						
			5d. Task # None						
		====	5e. Work Unit # None						
7. Performing Organizatio	n Name	& Address			8. Perform	ning Organization Report #			
Air Force Quality Institute 625 Chennault Circle				Proceedings 94					
Maxwell AFB, AL 36112-64	25								
9. Sponsoring/Monitoring Air Force Quality Institute	Agency	Name & Address			10. Monito	or Acronym			
625 Chennault Circle Maxwell AFB, AL 36112-64	25			11. Monitor Report # Proceedings 94					
12. Distribution/Availabilit	y Staten	nent UL (Unlimit	ed)						
				1		ON STATEMENT R			
	Approved for public released Discription Unlimited								
13. Supplementary Notes 11 - 14, 1995 at the Montg	This comery C	ompendium of pap ivic Center, Montg	ers wa omery,	s publis Alabam	hed for the a. Sponso	e QAF Symposium held October ored by Air Force Quality Institute.			
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15. Subject Terms Quality Air Force, QAF, Total Quality Management, TQM, Empowerment, Teams, Surveys, Customer Service, Process Action Teams, PAT, Deming, Groupware, Team Building, Feedback, Gap Analysis, Metrics, Quality Tools, Customer Satisfaction, Leadership.									
Security Classification of 16. Report 17. Abs U	ract	18. This Page U	19. Limita Abstra Unlimi		20. # of Pages 784	21. Responsible Person (Name and Telephone #) Capt Edward G. Wynn (334) 953-6492			

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History and Mission

The Air Force Quality Institute began in 1991 as a four-person organization.

Today, the institute is a separate Air

University organization with a staff of eighty team members. The institute is empowered by the Air Force Quality Council to provide commanders and their organizations with advice, concepts, methods, educational resources and a common frame of reference for attaining a Quality Air Force.

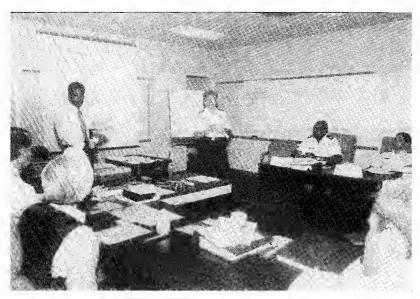


Lt Col Thomas Owen and Maj Jimmie Reeves review the master calendar of events for AFQI

Charter

The institute's charter is to be a center of quality improvement expertise, to provide quality leadership consultation, and to serve as a distribution center for the crosstell of quality improvement ideas, experiences and information. The charter also emphasizes a responsibility to develop and promote a commonality in quality language and methodology, and to develop an architecture for integrating quality training and education throughout the Air Force.

Consulting—with a major command focus, consulting teams provide specific training, tailored workshops, and on-site consultation services. These services include: assistance with unit self assessments, benchmarking and organizational strategic plans.



Lt Col Barbara Kucharczyk, director, Education and Research, puts quality principles to practice in the classroom.

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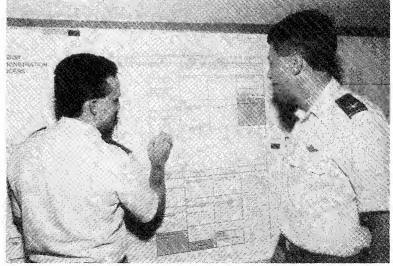
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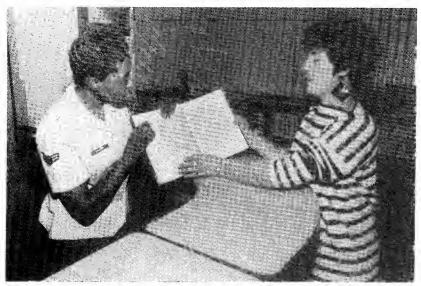
design and conduct; and QAF subject matter. In addition,
Education and Research assists with research on quality issues, and prepares and analyzes quality related surveys.
Products provided include survey samples, survey data, research topics and research results plus Quality Air Force courseware, seminar and workshop materials.

Quality Air Force Symposium—

an annual event with a professional trade exposition, interactive workshops, prominent quality speakers and presentation of the Chief of Staff Team Quality Awards.



Capt David Carter and Col Henry "Hank" Fiumara discuss keynote speakers for the 1994 Quest for Quality Symposium.



Airman 1st Class Natacha Grubbs helps customer, Sharon Harvey, with a book from the Quality Service Center.

Quality Service Center—

serves as a distribution point for leading-edge quality materials, products and information. The center provides books, videos and current periodicals to customers in the field.

Quality Information Team—a traveling team that brings a state-of-the-art custom built exhibit to your door in support of your conference, seminar or symposium. The QIT provides examples of quality products and services to include books, videos, curriculum and consulting that can be helpful in your quality journey.

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Program—is designed to allow AFQI customers to purchase commercial quality products, books and videos at the best price available.

QAF ONLINE—is a computerized bulletin board offering worldwide interaction. This service allows connection between the Air Force Quality Institute and other Department of Defense agencies.

Quality Air Force Criteria Survey—this survey identifies opportunities for specific improvement. It serves as a valuable tool in planning quality changes.

<u>OVision</u> (AFRP 38-2)—is the only Air Forcewide periodical serving as a medium for quality information exchange.

Air Force Process Improvement Guide—helps implement a structured approach for process improvement through the analysis of data and evaluation of possible solutions. It includes handson help with strategic planning and it introduces Air Force unit self-assessments.

The Quality Approach—is a user-friendly guide that provides the basic tools of quality implementation. It can be used in everyday work process to help generate ideas, make decisions, analyze problems and analyze data.





DEPARTMENT OF THE AIR FORCE

Dear Symposium Participant

Welcome to Montgomery, home to Air University and the Air Force Quality Institute. Our team is proud to serve as your host for the Air Force's second quality symposium. The response to this year's event has been phenomenal. With a maximum capacity of 2000 attendees, we sold out less than one month after registration began. Within just a few days of selling out, our waiting list grew to nearly 1000. The voice of the customer has certainly come in loud and out the Department of our waiting list grew to nearly 1000. The voice of the customer has certainly come in found and Clear; Air Force members are eager to build a Quality Air Force. Likewise, the Department of Defense community expects this symposium to be a valuable source for information and Detense community expects this symposium to be a valuable source for information and networking to improve America's Defense establishment. We're honored to share this symposium with mambars of private indicates. The Driving and Consider Armord Foreign and F networking to improve America's Detense establishment. We're nonored to share this symposium with members of private industry, the British and Canadian Armed Forces, as well as the United With members of private industry, the British and Canadian Armed Forces, as well as the Unit of States Army, Navy, Marine Corps, and Coast Guard. We hope that this week's activities will

Our theme this year is "Shaping the Future." We have an exciting agenda for you; keynote Presentations from top leadership, plus world renowned quality experts and Air Force members. Presentations from top leadership, plus world renowned quality experts and Air Force members.

The Link of this week will be the recognition of his Force torus. products and services. The highlight of this week will be the recognition of Air Force teams products and services. The highlight of this week will be the recognition of Air Force teams nominated for the Chief of Staff Air Force Team Quality Awards. You'll also have opportunities to network with the 2000 attendees.

I encourage you to take every opportunity this week to learn and to share your ideas and experiences. If we can be of service, please let us know; our goal is 100 percent customer with new philosophies technologies and experiences. If we can be of service, please for us know; our goal is 100 percent customathodologies which will halp change America's fixture. methodologies which will help shape America's future.

> HENRY ETIMARA, Colonel, USAF Commander, Air Force Quality Institute

Acknowledgements

The following are to be commended for their efforts in organizing and carrying out this year's Quality Air Force symposium:

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PART I

The Year 2000 in Quality

Automated Mission Incapable Aircraft Parts (MICAP) Monitor



SMSgt George P. Beckworth



SSgt Nicole Remy

BIOGRAPHY

SMSgt Beckworth, Chief Sortie Support, 54 Fighter Squadron, 3rd Wing, Elmendorf Air Force Base, Alaska, has an AS in powerplant Technology from the Community College of the Air Force. He is currently the Quality Advisor for the 54FS.

SSgt Remy, NCOIC Combat Orientated Supply Organization Section, 54 Fighter Squadron, 3rd Wing, Elmendorf Air Force Base, Alaska.

Automated Mission Incapable Aircraft Parts (MICAP) Monitor

Senior Master Sergeant George P. Beckworth
Quality Advisor, 54 Fighter Squadron, Elmendorf AFB, AK
Staff Sergeant Nicole Remy
NCOIC Combat Orientated Supply Organization, 54 Fighter
Squadron, Elmendorf AFB, AK

Abstract

This paper introduces a model for Combat Orientated Supply Organization (COSO) units, to establish an Automated Mission Incapable Aircraft Parts (MICAP) monitor in an aircraft maintenance squadron. This model was the results of a working group in the 54 Fighter Squadron (FS), Sortie Support Flight.

Background

Why have an Automated (MICAP) monitoring system?

In January of 1993, the construction of the new 54FS Sortie Support Section was completed. Before moving in, we lost over 1,000 square feet of space from the old support section to the new one. We immediately encounter a problem trying to figure out how to place our 4'x16' status board into our new section. The process of how we received status, over the phone, finding the time to document the (MICAP) board correctly, and later on verifying if the status had changed added to the need to change this process. By mid-January, we started a working group and out of this group, the Automated (MICAP) monitoring system was concieved.

Introduction

What is an Automated (MICAP) monitoring system?

The Automated (MICAP) monitoring system is an office information and data system. It consists of a 35-inch, big-screen color monitor, laptop computer, and a self-written program of a (MICAP) display board. The big-screen monitor is located in the center of the (COSO) work station. It displays all current (MICAP) status--easily and visible to (COSO) and maintenance personnel. A computer link from the main supply Micap Asset Sourcing System (MASS) computer to the laptop computer automatically updates the big-screen monitor as status inputs are made. Status changes at the laptop computer in (COSO) are not necessary because all inputs are received and updated by the (MASS) computer. The aircraft maintenance squadrons can network this system throughout their sections, allowing for quick identification of critical (MICAP) parts status on or off base. Formtool is used to create the written program for the (MICAP) display board. attachment number one for Automated (MICAP) display system and number 2 for the screen display.

Advantages

What are the advantages of this system?

There are several immediate advantages of the Automated (MICAP) Monitor system: _ 100 percent accuracy of (MICAP) status

_ (MICAP) status always current and up-to-date

provides to easy access Network system

other units statues

_ Management decisions can be made immediately

- _ (MICAP) personnel can be freed up to work more critical issues
- Frees up existing computer system for research and normal use
- Reduces telephone traffic between units and (MICAP) section

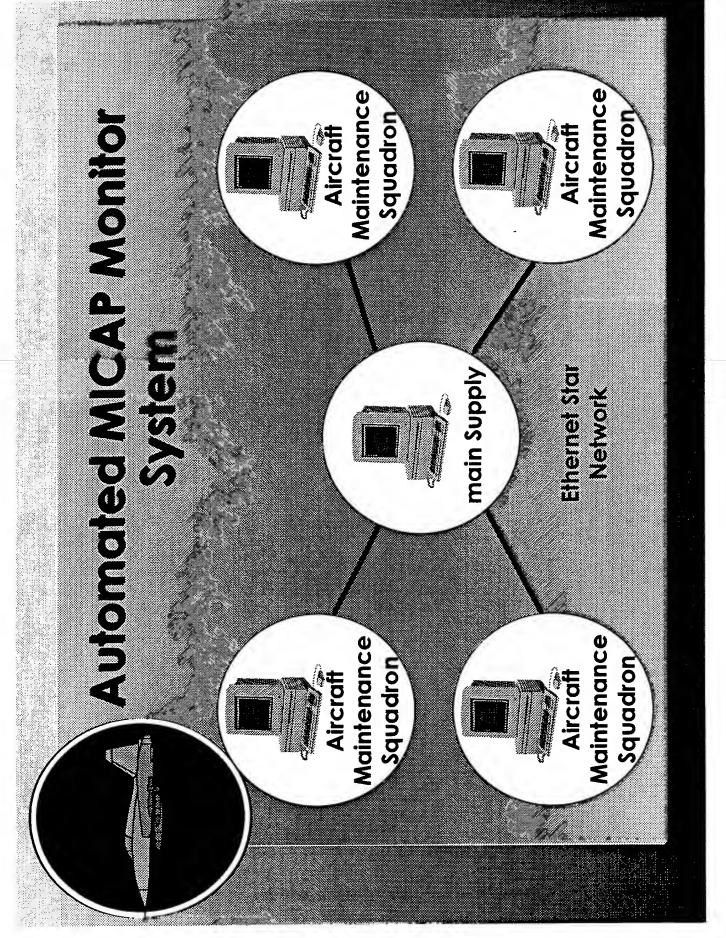
Cost

What is the cost?

- 35 inch big screen monitor \$6,000
- 486 SX computer \$4,000
- Formtool Program \$60.00

Conclusion

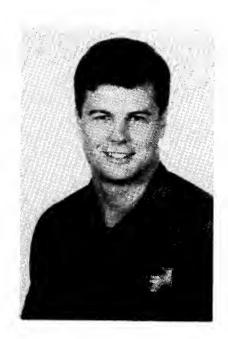
In closing, the Automated (MICAP) Monitor system is a new and innovative way to track (MICAP) part status. It can easily be adapted to an existing computer system and (COSO) sections with no additional training to personnel. This system saves space and improves the process of tracking (MICAP) parts, in an office information and data system. Automated systems like this will lead us into the year 2000 and beyond.



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Communication in Quality



2d Lt David J. Tate

2d Lt David J. Tate is originally from N. Canton, Ohio. He is a 1992 graduate of the United States Air Force Academy and currently serves as the adjutant/section commander for the 74th Fighter Squadron, Pope Air Force Base NC. In addition to being the squadron quality advisor and trainer, he has also seved as the squadron representative on the Operations Group USA team and has co-authored the squadron's quality charter.

Communication in Quality Lt David J.Tate 74th Fighter Squadron

As the Air Force embraces the Quality movement, new tools are becoming readily available to further the initiatives. Although these tools and techniques are invaluable to the overall implementation of quality, they often times become a detractor to personnel not founded in statistical ability or managerial theory. Sometimes, the quality movement has been characterized as cumbersome and methodical. Many people believe in quality principles, but are dumbfounded with all of the intricate guidelines to properly implement quality. This perception has become a major obstacle in implementing quality procedures at the squadron level in the Air Force. The quality movement can bring in these people from the fringe and create a quality culture now and in the future by focusing on interpersonal and organizational communication.

Communication is a founding principle behind the quality movement and will be an integral aspect in the Air Force of tomorrow. "By effectively communicating, information can be shared, duplication eliminated, conflict between people and departments limited, and fewer resources wasted (Berko, Wolvin, Curtis 38)." Effective communication is the most basic step any organization can take to bring about behavioral change.

Communication is paramount in leadership and management because every organizational and interpersonal action involves some form of communication. Everything we do is some form of communication, even utter silence is a form of communication, thus it is impossible not to communicate. The perplexing thing about communication is that it is seldom acted upon in the organization. We realize that communication is an unavoidable aspect of every day work and life, yet we continually allow poor communication to exist. We in the Air Force spend countless hours examining different processes within our units, yet we spend little time on discussing the dynamics of communication and how we can improve it. To forge the quality culture of tomorrow, effective communication between people and organizations will be a crucial aspect of day to day business. This paper will enlighten that statement. Specifically, I will examine some of the problems with poor communication and outline three distinct areas of interpersonal and organizational communication that will enhance our effectiveness in the Air Force of tomorrow.

Poor Communication

Poor communication within an organization tends to be the rule, not the exception. We have all experienced poor communication numerous times in our professional and daily lives. In fact, "communication anxiety is the nation's number one psychological problem, as it affects about 80 percent of Americans . This anxiety is related to a persons real or perceived anxiety with communicating with others" (Berko,

Wolvin, Curtis 91). Communication anxiety prevents people from interacting with others and prevents them from speaking up for what they believe. In a work environment, this apprehension could prevent people from defending themselves when wrongly accused or voicing their displeasure with an undesirable assignment (Berko, Wolvin, Curtis 92). This communication anxiety gives people a proclivity to withhold vital information and feedback that could help organizational effectiveness. Another problem of communication is perception. Often times, problems within an organization are enlarged through misperceptions. These misperceptions often lead to resentment and hard feelings which are harmful to organizational trust and cooperation. Through a few simple steps, we can minimize these anxieties and misperceptions while facilitating an environment of openness. In addition, we can seek to minimize or eliminate some of the traditional characteristics or results of poor communication as listed below:

- one way communication
- no group formulation of goals
- no group work at all
- individual effort is stressed over teamwork
- fellow employees are regarded as enemies rather that allies
- no forum to voice complaints
- misunderstandings
- no inter office or inter organization communication
- barriers inhibit constructive feedback

These problems are not new, they have always existed in organizations. The quality movement has now just re-focused attention on these problems. All of the above problems exist in some form in your organization right now. Some may be minimal but others could be enormously large. Whatever the case, these problems are all symptoms of poor quality and are constantly battling our effectiveness and the effectiveness of our organizations. Thus, it is absolutely imperative that we examine some dynamics of communication when undergoing any discussion of quality cultures. Effective communication will improve morale, enhance trust, and create an environment of cooperation. The question remains, how did we get to the point we are at now?

Actually, it stems from what we have experienced and observed in the past. We have become what we observed as children, as students, as members of a team, or as a member of an organization. We have continually observed poor communication techniques and have learned to perpetuate them. Therefore, our poor communication skills are learned honestly. We've never been taught effective communication. In fact, even from our earliest times in school we were taught the wrong way to communicate. Think back to your days as an elementary student. More often than not, you observed and experienced poor communication on a daily basis that has become part of your behavior today. In your classroom, there was a teacher and his or her pupils. The teacher most likely taught in the following manner: Communication in the class room was one way, as the teacher communicated the students did not interact in that communication; the goals of learning were seldom established by the participants, the students had no say in the

establishment of learning goals; leadership was held in the hands of a responsible leader, in this instance, the teacher; the lack of two way evaluation increased the distance between student and teacher; the teacher was established as the **only** resource person rather than a resource, students were thereby inhibited to expand themselves; students were pitted against each other rather than in a cooperative venture; and finally, learning was passive because the student did not have any interactive stake in the communication process (Napier, Gershenfeld 35.) Such forms of communication are against the very principles of quality. In order to create an environment where communication can lead to a synergistic approach to quality, we must distance ourselves from these traditional forms of communication—we must break the communicative paradigms of the past. Therefore, we must enhance our awareness of our communication processes while we continue to implement Quality Air Force principles in our organizations.

Communication and Teamwork

The first step in enhancing organizational effectiveness is realizing and continually communicating the importance of teamwork. Essentially, we as organizations and people must become increasingly cooperative in nature. Specifically, we in the military will become more dependent upon joint operations with not only our own US militaristic forces but with our NATO allies as well. With less resources, personnel, and equipment, we will increasingly have to depend on each others collaborative efforts to meet growing world threats. Joint communication will become all the more crucial as different forces and services jointly cooperate. As Dr. Deming has noted, "Quality cannot be obtained, and improvement is impossible, without cooperation: cooperation among workers, among managers, between workers and managers, between the company and its suppliers, and even between the company and its competitors" (Aguayo 83). Professor Haney, a published author on the dynamics of communication, continues by saying, "If an organization is to succeed in a competitive environment, its members will have to do more than just interdepend - they will have to collaborate and work together as a team" (13).

Dr. Deming noted in Rafael Aquayo's book an example of cooperation at brokerage houses. Dr Deming stated, "I've been to a brokerage house where everyone works on commission and no one would pick up anyone else's phone because he or she personally had nothing to gain. I've also done business with a firm that has a team philosophy, and I could speak to any one of five brokers. The team approach provided me a much better level of service than I experienced elsewhere" (Aguayo 196). Essentially, the brokerage house example is the synergistic approach we need to develop within our organizations. Once we develop effective communication and mutual trust, collaborative efforts to organizational problems will become the rule, not the exception. In fact, Dr. Napier, an author on group dynamics, points out that, "research shows that when people enter into a task with a pre-defined need to be cooperative and interdependent, there is more listening, more acceptance of ideas, less possessiveness of ideas and more

communication. Within such an atmosphere, the group also tends to create achievement pressure itself. Furthermore, there seems to be more attentiveness to members' ideas and a friendlier climate than in groups where interpersonal competition is stressed' (36).

In 1949, Deutsch conducted a classic study on the effects of cooperative and competitive conditions in attaining group goals. Specifically, he discovered that, "productivity per time unit was greater in cooperative than in competitive groups and that quality of both the products and the group discussions were higher in the cooperative groups" (Napier, Gershenfeld 198). The chief difference between the competitive and cooperative environment is the element of trust. We can build our collaborative aspects of organizations through building upon mutual trust and communication.

Communication and Trust

Essential to any relationship is trust. Without it, synergy and cooperation have little chance of succeeding. Without mutual trust, no relationship will stand the test of time. No friendship, no marriage, no organizational relationship. Leadership must establish and communicate trust throughout the organization. The willingness to cooperate is hindered or hampered by the amount of trust existent within the group at the time. If we do not trust those we are working with, we no longer look out for the welfare of the group, rather, we look solely to the interests of ourselves. Dr. Haney states, "members of an organization must genuinely believe that the best way to help themselves and their organizations is by being trusting of others, and by being trust worthy themselves. I must believe that others will not abuse my trust for their short-range gain. Conversely, I must be trustworthy, recognizing that to take advantage of another's trust usually leads to defensiveness, retaliation, and escalating conflict" (15). To build a quality culture, all members must trust leadership, and leadership must trust the employees.

The openness of the organization allows for open and candid expression of feelings and ideas - very little is held back. Even faulty communication does not lead to immediate retaliation, for others do not presume maliciousness in the miscommunication. Dr. Haney notes that a lapse in communication is viewed as an opportunity to learn and others compensate for the miscommunication. In addition, effective communication will continually reinforce and enhance an existing trusting climate. In organizations wrought with mistrust and hostility, communication tends to suffer. In such an atmosphere, true feelings are suppressed for fear of revealing their true feelings. When a member slips, no one helps that person, the person now serves as a useful scapegoat for others who seek criticism away from themselves. For the most part, ones communication is dominated by the need to protect oneself rather than the desire to serve the interests of the organization. Good communication serves as a means - not an end in itself. This mutually trusting relationship also stimulates high performance. In a survey of over 9,500 managers, they felt that subordinates generally respond better to their superiors' genuine confidence in them. These subordinates tried to justify their bosses' good estimate of them. This high

performance then reinforced high trust, for it is easy to trust and respect a person who continually meets or exceeds the bosses' expectations (34).

William Ouchi talks of trust and communication when he discusses his management theory entitled Theory Z. This theory builds on trust and is "a way of communicating to people that they matter as people not as parts. The result of establishing a trusting interpersonal relationship with employees is to give them a reason to feel committed to the organization, to feel good about working within it. The process is one in which individuals who are accustomed to depending upon one another, who have a long term commitment to their working relationships, and who work well together will form cohesive groups and naturally be more adept at tackling problems they all must face" (Berko, Wolvin, Curtis 36). In summation, the coexistence of open communication and mutual trust brings about greater cooperation and therefore greater productivity.

Communication Awareness

"The manager who gets results is the effective communicator" (Berko, Wolvin, Curtis 36). So, how do we become a better communicator to facilitate organizational and behavioral change? The effective communicator will realize that constant effort must be exerted to truly achieve excellent communication within any organization. In addition, trust and teamwork needs to be communicated and acted upon continuously. This awareness will affect behavioral change and the organizational climate will be more receptive to quality principles.

The organizational climate can be changed to one of trust and teamwork through the leader focusing on a few small steps. The first step is for leaders to realize the importance of two way communication through feedback, both at the interpersonal and organizational levels. Feedback is the leadership tool which effectively administers behavioral change and in turn, organizational change. This is so because the organizational culture is the product of individual behaviors within that organization. Thus, positively changing the behavior in some of your fellow workers will be contagious. In addition, leadership solicitation of feedback needs to be continually highlighted as a fundamental lesson of the quality movement. Quality Improvement Councils are an excellent forum in which to solicit feedback and provides an open forum for group formulation of goals and objectives. This type of two way communication builds trust and cooperation.

A leader must provide feedback to his or her subordinates. This is often talked about and expected, but often times it does not achieve its intended purpose - to motivate employees toward personal and organizational effectiveness. All too often a subordinate does a superior job and no feedback is given. The leaders silence creates apprehension and anxiety within the subordinate which directly inhibits teamwork and trust. In another scenario, the leader does continually give feedback, however, the feedback is usually negative. This results in a demotivated worker who will be unenthusiastic about being a

"team" player. A strong motivating tool, however, is positive feedback. Effective use of positive feedback can consist of just a quick note or short verbal praise. These short communication efforts can go a long way to affecting positive behavioral change. A renowned author and consultant, Dr. Ken Blanchard, is a firm believer in the principles of timely feedback, both positive and negative. In fact, Dr. Ken Blanchard wrote the widely read book, The One Minute Manager. Specifically, Blanchard believes an effective manager is one who:

- Mutually establishes and accepts goals of both the superior and subordinate
- Administers one minute praises. Tell people when they have done an exceptional job.
- If necessary, give subordinates a one minute reprimand.

As Dr. Blanchard discussed, the effective manager, or leader, is one who seeks and gives constant feedback. This feedback opens the communication lines and a climate of trust and cooperation ensues. This aspect of feedback is a means of reducing distortions and misperceptions throughout the communication process. "Feedback is the process by which we find out whether the message intended is the message actually received" (Napier, Gershenfeld 32). When undergoing any type of communication, "a person is faced with a choice of behavior from which to extract pertinent messages, and even the simplest communication may be misinterpreted and misunderstood. The antidote is feedback. In a group, honest feedback can increase accuracy, instill a sense of being understood, and promote closeness and a sense of confidence" (Napier, Gershenfeld 32).

The second step is for leaders and managers to focus on clarity. All too often, orders are given quickly and people are left guessing what to do, only hoping to accomplish the task correctly. When outlining a task, a goal to achieve, or any other job, we must ensure the subordinate knows what to do and where to go to facilitate the task. Artificial and actual barriers produce confusion which inhibits the subordinates ability to produce desired results. We can eliminate this confusion by clarifying ourselves. In addition we need to outline tasks using universal terminology and create a forum from which the subordinate can clarify any misunderstanding (Berko, Wolvin, Curtis 136). Clarity in speech and direction minimizes miscommunications and results in an empowered employee, readily equipped to accomplish the task at hand.

Leadership's Challenge

Every member in an organization, in a group, in a family, or on a team, wants to feel secure, understood, and have membership in the organization. Like a missile, communication homes in on these needs and hits them dead on, alleviating problems and satisfying needs. When subordinates are able to voice their needs, leaders are in a position to empower them. Leaders will be able to meet many of these basic needs through the establishment of trust, synergy, and feedback. In addition, leaders who open the

communication lines to allow for two way communication will start seeing quality firmly embraced. This occurs because a quality culture has free and open communication both at the organizational level and with their suppliers and customers. This effective communication allows for the establishment of mutual trust and the employees are willing to take the quality plunge. Communication principles will enhance the quality initiatives today and will be the binding force in the quality movement in the Air Force of tomorrow.

In leaving you today, I challenge you to focus on your communication in the three distinct areas that I have discussed today. One, as a leader, you must continually communicate teamwork and synergy within your organization. Secondly, you must communicate trust within the unit. This trustworthiness will enhance the collaborative efforts within the organization. Thirdly, you must continually work on communicative awareness, specifically, the establishment of effective feedback. Coupling all three of these aspects together will enhance performance, facilitate synergy, and lay the foundation for quality initiatives in the future.

Works Cited

Aquayo, Rafael. Dr. Deming. Simon and Schuster, New York, 1990.

- Berko, Roy M., Wolvin, Andrew D., Curtis, Ray. <u>This Business of Communicating</u>. Wm. C. Brown Publishers, Dubuque, Iowa, 1986.
- Blanchard, Kenneth. The One Minute Manager. Marrow Publishing, New York, 1982.
- Haney, William V. Communication And Interpersonal Relations. Irwin, Homewood Illinois, 1992.
- Napier, Rodney W., Gershenfeld, Matti K. <u>Groups, Theory and Experience</u>. Houghton Mifflin Company, Boston, 1993.

Coping in the Coming Radical-Humanist Paradigm



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Coping in the Coming Radical-Humanist Paradigm

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Quest for Quality '94

Abstract

This paper will address the following themes:

- 1. Society, technology, and people are changing: organizations are trying to keep up.
- 2. Organization and management theory is evolving along with society.
- 3. The quality movement is an evolutionary human technology that is moving us toward more human notions of organizing.
- 4. An important organizing theory of the twenty-first century will be radical-humanism.

The Principles of Radical-Humanist Management

To actualize the organization of the future, follow the principles of radical-humanist management:

- 1) Recognize that social reality is subjective and open to interpretation and discussion.
- 2) Allow workers to wander around and develop a sense of the whole organization.
- 3) Make communication of ideas, concepts and feelings an integral part of organizing.
- 4) Maximize use of new communication and computer technologies.
- 5) Facilitate education and training opportunities for all workers.
- 6) Recognize intuition as viable basis for organizational decision making.
- 7) Make the overall goal of organizing activity the maximization of human creativity.

Last Gasp of the Zombie

The bureaucratic organization is dead, but like a zombie-slave, it continues to trudge around the scene without character or will. To ensure that the zombie of bureacucracy is truly dead, we must sever its head from its body. This is the custom in Haiti, where family and friends of a

suspected zombi perform this gruesome act on the cadaver to keep their loved one from the horrible fate of the zombi-slave. The quality movement keeps trying different potions and spells, but just hasn't kept bureaucracy in the grave. Unfortunately, surviving Hougon-Bokors (zombi masters) keep converting people into zombies. These unfortunate bureaucrats lose their ti bon ange (the essence of one's individuality). These Hougon-Bokors too often hold positions of authority throughout today's large organizations.

A number of external forces are at work destroying the last vestiges of bureaucracy and freeing workers from the thrall of the *Hougon-Bokors*. These forces include the sheer pace of change. Lumbering bureaucracies can no longer cope with the flood of technological, political and regulatory, ecological, and educational change confronting them. The sheer volume of information means that no single person, or small group, is at all capable of registering all of these environmental changes. Another force working to bury bureaucracy is rising expectations of workers. In the information age of the *nano-second* 1990s, people are expecting more of all institutions. The world has never witnessed so many people living, with so much education, with so much instant access to everything, with so many demands for which they no longer accept silence from ruling elites. Just as democracy is enjoying a ground swell of bottoms-up support around the globe, workers expect a more participatory environment in organizations. As the quality movement gains momentum in organizations, we witness the clash of two fundamentally different sets of assumptions about how organizations should behave.

What's Your Weltanshaung?1

The fireworks resulting from this clash of assumptions is really the clash of two different paradigms. According to sociologist Gareth Morgan, the existing paradigm is functionalism. The new paradigm, of which the quality movement is the herald, is radical-humanism. The model (reference figure 1, from Morgan, 1984) defines four paradigms situated along two dimensions. One dimension represents assumptions about the nature of science. The extreme positions on the dimensions are: the social community is objective or real, versus the social community is subjective or open to interpretation and redefinition. The other dimension represents human preference for order versus change. The four paradigms represent schema for viewing human organizations.

The two dimensions of the model relate to the two over-arching forces burying bureaucracy. The change dimension is increasing at an exponential rate, as each new development in science and technology begets more change. The view of reality dimension relates to the rising expectations of workers. Most people in developed nations no longer subscribe to an absolutist view of reality. The "divine right of kings," an example of an unchallengable absolutist notion, was largely discredited in most of the world by the time of World War I. After the national traumas of Vietnam and Watergate, the citizens of the United States no longer believe that the world view described by our ruling elites is the absolute truth. The quality movement has

 $^{^1}$ Weltanshaung is the German phrase for *world view*. Paradigms are also *world views*. Joel Arthur Barker (pg 33), defines paradigm as a set of rules or regulations that defines boundaries and prescribes behaviour within these boundaries.

extended this notion into business organizations as we recognize the factors that contribute to malleability of world views.

The remainder of this paper will look in greater detail at Morgan's four paradigms. The functionalist paradigm describes how we have thought about organizations for centuries including the *modern bureaucracy* described by Max Weber. The interpretivist paradigm contributes to the discussion of views of reality. The radical-structuralist paradigm contributes a critical view of functionalism. Finally radical-humanism offers an alternative paradigm to functionalism based on entirely different assumptions.

Morgan's Model of Human Organizing

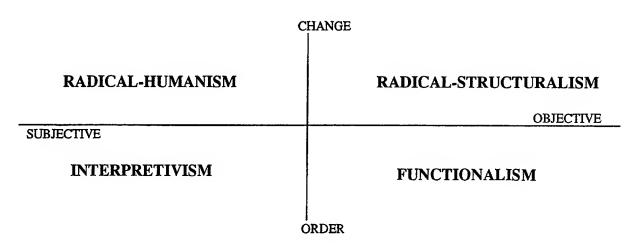


Figure 1

The Functionalist Paradigm

The assumptions of the functionalist paradigm -- based on a preference for order and an objective view of social reality -- are:

- 1. Reality is objective.
- 2. Perceptions, biases and personality do not affect objective reality so that organizations may generate knowledge (facts) that may regarded as valid and reliable.
- 3. Functionalism creates a language for the management and control of organizations.
- 4. Functionalist reality provides a mirror through which organizations may view their performance.
- 5. Problems are definable, solutions to these problems exist, and managers can implement these solutions given enough resources.

(Morgan 1986, pp 308-311.)

We are all socialized to believe these assumptions. The first two of these assumptions are already widely discredited today. No one believes that all facts are discernible. Even while today's standard business texts recognize that objective reality is a specious concept, our managerial thought and organizational structures are based on this premise.

Assumption three seems valid enough. The concern is that unique and specialized managerial languaging becomes an impediment to effective communication and thus, organizational effectiveness.

The mirror discussed under assumption four refers to profit, as applied in private business in market economies. Success is measured in terms of profit. In governmental organizations, the emphasis has been on productivity and output. This mirror is what drives leaders of enterprises to view their human resources as simply another tool of productivity.

The fifth assumption above is equally specious as the first two assumptions. Not every problem is definable. What is the drug problem in the United States? How can we increase economic growth without further harm to the world ecosystem? How do we improve employee morale? Or problems may have solutions that are achievable only with unrealistic resource requirements: The United States will put a man on Mars in the next thirty years (but at a what cost?).

In short, assumptions one, two and five seem more like myths. Assumptions three is in conflict with four. Finally, is assumption four -- profit and output -- really what we want our organizations to strive for? Do we really want to put gross production ahead of developing human potential and creativity?

Within in functionalism, we find Classical Management Theory, Scientific Management, Contingency Theory, and the Human Relations school of management including Theories "Y" & "Z." Morgan describes organizations within functionalism as machines, organisms, brains, political systems, and cultures.

The Interpretivist Paradigm

The interpretivist paradigm is descriptive, not prescriptive like the other three paradigms. Karl Weick, who Morgan identifies as the originator of the metaphor of enacted sense making, creates a model that supports taking a subjective view of reality. Morgan's assumptions align with Weick's view of human social psychology. The assumptions of the interpretivist paradigm are:

- 1. Objective reality is a myth.
- 2. Thus, no person can define or gain knowledge of an objective environment.
- 3. Our reality is a socially constructed phenomenon invented to facilitate human interaction.
- 4. The reality we perceive as objective is made up of laws, rules and myths generated by people who are imbued with power by this same reality.

(Morgan, 1980, pp 313-316)

Weick's model² describes the process of creating in-the-head models (cause maps) of interactions of people. These models can describe interactions within families, communities, or task-oriented "work" organizations. The model describes how each of us enact pieces of social

² Weick's model is too complicated to present in its entirety in this paper.

reality, select meanings, and retain knowledge for future application.

Weick views organizations as not much more than the collective interpretation and shared meaning among participants (Weick, 1979, p 18). Organizations, then, exist only as cause maps in our heads. Viewing organizations as organisms or machines over-objectifies them and exposes one of the false assumptions of the functionalist paradigms. The interpretivist paradigm views all social groupings as created by people. Weick's model demonstrates how these cause maps are created. In summary, we enact chunks of reality to attend to, we select a meaning, and then create or modify our cause maps. These cause maps are manifested in organizational life as patterns of interaction among people.

The primary implication of Weick's dynamic is that no single person has an objective view of social reality.

The Radical Structuralist Paradigm

The radical-structuralist paradigm contains Marxist thought. While Communism throughout the world is in retreat, the ideas of Marx - unadulterated by the likes of Lenin, Stalin or Mao - bear reconsideration. When ideological trappings are stripped from Marxist thought, what is left is a "rigorous mode of social analysis, which generates insights of a distinctive kind" (Morgan, 1980, p 320). The implications of this analysis result in the following radical structuralist assumptions:

- 1. Everything changes itself as a result of the tensions that its very existence creates. For example, any act of management immediately sets up a dialectical tension between itself and the managed situation.
- 2. Beneath the veneer of the empirical world, unspoken assumptions cause the empirical world to take shape.
- 3. The role of organizations can only be understood in terms of the role they play in the whole.
- 4. The seeds of the next transformation or crisis are planted during periods of relative stability.
- 5. Constraints to establishing a new social order must be identified and overcome. (Morgan, 1980, pp 320-323)

The Morgan metaphor that most closely aligns with Marxist thought and grounded in the assumptions above is the domination metaphor. The domination metaphor discusses how the goals of a few are pursued by the work of many. Max Weber, despite being credited as the father of bureaucracy, thought "the process of rationalization itself is a mode of domination" (Morgan, 1986 p 278). Weber goes on to say:

"As we become increasingly subject to administration through rules and engage in strict calculations relating means and ends and costs and benefits, we become increasingly dominated by the process itself. Impersonal principles and the quest for efficiency tend to become our new slave drivers".

Morgan identifies another metaphor in the radical structuralist paradigm - the transformation

and flux metaphor. No less a guru than Peter Drucker has alluded to the idea of managing in chaos. Drucker discussed the idea of making middle managers change agents (Drucker, 1988, pp 25-27). Presaging Tom Peters book, *Managing in Chaos*, Mark Goldstein writes: "If anything symbolizes what managing in the 1990s will be all about, it is the idea of fluid change - even *chaos*, as some have described it" (1988, p 21).

After James Gleicks' work on the science of chaos, articles in serious management digests like Human Resource Planning say things like "managing flexibility requires maintenance of a creative tension between order and chaos" (Walker, 1990, 126). Morgan's discussion of the transformation and flux metaphor covers much philosophical territory and many new theories that might be applied to organizations -- autopoiesis, self-producing systems, mutual causality, and even dialectical change (Morgan, 1986, pp 233-272) -- that are beginning to manifest themselves in current thought about organizations.

Radical-Humanism

"The radical-humanist paradigm is defined by its concern to develop a sociology of radical change from a subjectivist viewpoint" (Burrell and Morgan, 1987, pp 32). In building their model, Morgan (1984, pp 317-320) identifies five main assumptions of radical-humanism.

- 1. The radical-humanist perspective searches for the ideological traps and blinders that lead human beings to feel powerless in dealing with the contingencies of their everyday world.
- 2. The radical-humanist perspective draws attention to the power dimension underlying enactment processes.
- 3. The radical-humanist perspective reveals the ethical dimension embedded in systems of meaningful action.
- 4. Radical-humanism highlights the unconscious significance of organization.
- 5. Radical-humanism advocates an ideology that places people first.

The first point is that radical-humanism is subjectivist. On the *view of reality* dimension of Morgan's model (see figure 1), the underlying assumption is that no single person has the "truth." The implication of this is a leveling of the human race. One's weltanshaung is dependent on culture, education, experience, and blind chance. Therefore, informed discussion is the only basis for divining truths as defined by scientific or empirical principles or laws (Bohman, 1990, Habermas, 1973, Thiele, 1990). Since the whole spectrum of immutable absolutist truths are questionable, this undermines the coercive and legitimate power of all authority figures.

The second assumption of radical-humanism involves the enactment process. Weick describes the enactment process as noticing things in the environment. As the things flow by, humans use rules and conversations to select chunks of the environment to attend to (Weick, 1979, pp 130). These rules are often governed by what various authority figures want us to select. These rules contribute to in-the-head models which we use to govern our actions (Weick terms these models "cause maps"). Since authority figures contribute greatly to creating cause maps, this illustrates the power dimension underlying organizations. Even critical theorists like Foucault believe we

cannot escape this dynamic. Foucault says that the first step to *true freedom* is understanding the power dimension underlying organizations inherent in the enactment dynamic (Thiele, 1990).

The implications of the third assumption of radical-humanism is that all individual and group actions have normative consequence; that is good or evil consequences. This provides another avenue for radical-humanists to critique the performance of functionalism vis-a-vis ecological damage, dehumanizing working conditions, exploitation of peoples throughout history, maldistribution of wealth, the economic growth model and concomitant focus on profit as the yardstick of human development, the anomy and stress of life in functionalist organizations, and so on. Radical-humanism calls for changing the existing functionalist social order with its many normatively evil consequences for something better.

The fourth assumption deals with the unconscious significance of organizations or symbology. The dominant symbol driving the activity of most of the world is economic growth on a macro level and profit at an organizational level. In bureaucratic organizations, the dominant symbols were written records and reports. In our present less authoritarian bureaucracies, metrics are the primary symbols. The significance of all activity is viewed through the lens of measurement. Unconsciously, we modify our behavior to drive the metric in the right direction. The very act of measurement has created tension in the organization toward change. In a radical-humanist organization, the dominant symbol is creativity. Creativity is the only comparative advantage humans have over machines (the definition of machine includes computers). Radical-humanists believe a focus on increasing creativity will mitigate many of the normatively evil consequences of functionalism. Of course, the challenge to the quality movement is to create good measures of creativity.

The final assumption, as identified by Morgan, of radical-humanism is placing people first. The implication for organizations is that people come before the organization. Since organizations are nothing more than the fabric of social reality created by humans to serve humans, we are empowered to change them at our will. Further, because social reality is simply the result of collectivization of people's in-the-head cause maps, the notion of placing someone's cause map ahead of another human's welfare is normatively repugnant to the radical-humanist.

Weakness of Radical-Humanism

The most glaring weakness of radical-humanism is nexus, or putting theory into action. No theorist has defined an action plan for creating radical-humanist organizations. A second major weakness is that neither radical-humanists nor Karl Weick deal with individual normatively evil behavior. Whether we're born evil, as many religions assert, or if we're evolved from animals, as many analytic scientists conclude, people still exhibit normatively evil behaviors. Radical-humanists assume ipso facto that people are essentially normatively good.

Total Quality Humanism?

Despite the weaknesses of radical-humanist theory, the advanced societies of the world are migrating toward the new paradigm. If we examine the tenets of Total Quality we see movement over Morgan's dimensions and toward radical-humanism. Recognizing the contributions and

knowledge of each individual and synergizing this power through teamwork is pushing organizations to adopt a more subjective view of reality. At the same time the quality movement advocates changing the culture. The word 'change' is part of the tenets and aligns with Morgan's other dimension of change versus order. The quality movement itself is actually part of the technological changes that are driving society away from the orderliness of the functionalist paradigm.

One interpretation of the current state of organizational life is that many organizations are operating in the radical-structuralist paradigm. Tom Peters' recent book about *Thriving on Chaos* describes radical-structuralism especially as it pertains to Morgan's transformation and flux metaphor (Morgan, 1984, pp 233). Any organization that re-invents itself on a regular basis fits into this schema. Peters' most recent offering, *Liberation Management*, more closely aligns itself with radical-humanism. His wonderful description of the interplay between Wal-Mart -representing a fairly close approximation of radical-humanism -- and Sears -- representing quintessential functionalism -- shows how the creative, nimble, and information rich Wal-Mart is beating the stodgy and bureaucratic Sears at every turn (Peters, 1992, pp 378, 471, 621-3).

Anti-bureaucrats

As we migrate toward the *radical'* paradigms, we will first encounter **Anti-bureaucracy**. We will know we are there when organization are built upon these principles:

- 1) Organizations are nothing more than people communicating.
- 2) Organization structures are only in-the-head models which we readily ignore in order to more effectively interact with people.
- 3) The overall goal of organizating is maximizing human productivity. (Zingler, 1993)

As we continue to experience exponential change and as social reality becomes increasingly subjective, eventually the full seven principles of radical-humanist management (as displayed in the beginning of this paper) will be the basis of for much of human organizing activity. As radical-humanism increasingly asserts itself as a viable paradigm for organizing, a number of issues will come to the fore. These issues include: the role of leaders; control of organizations; the role of functionalists in radical-humanist organizations; issues of organizational boundaries; and the interplay between robotics and artificial intelligence and radical-humanism. While these subjects are beyond the scope of this paper, they will provide fertile areas for exploration in the future.

Bibliography

Barker, Joel Arthur. (1992). Paradigms: The Business of Discovering the Future. New York: Harper Collins.

Bohman, James F. (1990, March). Communication, ideology, and democratic theory. *American Political Science Review*.

Burrell, Gibson and Gareth Morgan. (1987). Sociological paradigms and organizational analysis. London, England: Heinemann.

Courtright, Fairhurst, & Rogers. (1989, V. 32) Interaction patterns in organic and mechanistic systems. Academy of Management Journal.

Dreyfus, Hubert L. and Paul Rabinow. (1983). *Michel Foucault: beyond structuralism and hermeneutics*. Chicago, Illinois: University of Chicago Press.

Drucker, Peter. (1988, April 18) Tomorrow's Restless Managers. Industry Week.

Gerth, H. H. and C. Wright Mills. (1946). From Max Weber: essays in sociology. New York: Oxford University Press.

Goldstein, Mark. (1988, April 18) Just 'Managing' Won't Be Enough. Industry Week.

Habermas, Jurgen. (1973). Theory and Practice. Viertel, John, tr. Boston: Beacon Press.

Huspek, Michael. (1991, June). Taking aim on Habermas's critical theory: on the road toward a critical hermeneutics. *Communication Monographs*.

Morgan, Gareth. (1986). Images of organizations. Newbury Park, California: Sage Publications.

Morgan, Gareth. (1984, November, Volume 16, Number 3). Opportunities arising from paradigm diversity. Administration and Society.

Morgan, Gareth. (1980). Paradigms, metaphors, and puzzle solving in organization theory. Administrative Science Quarterly.

Ouchi, William. (1981) Theory Z. New York: Avon Books.

Peters, Tom. (1992). Liberation Management. New York: Alfred A. Knopf.

Peters, Thomas, J. (1987). Thriving on chaos. New York: Alfred A. Knopf.

Sullivan, Jeremiah. (1983, Volume 8, Number 1) A Critique of Theory Z. Academy of Management Review.

Thiele, Leslie Paul. (1990). The agony of politics: the Nietzchean roots of Foucault's thought. *American Political Science Review*.

Walker, James. (1990, Volume 11, Number 2) Managing Human Resources in Flat, Lean and Flexible Organizations: Trends for the 1990s. *Human Resource Planning*.

Weick, Karl E. and Karlene H. Roberts. (1993). Collective Mind in Organizations. Administrative Science Quarterly.

Weick, Karl E. (1979). The social psychology of organizing. New York: Random House.

Zingler, Scott. (1993, October 29). Become an Anti-bureaucrat. Skywriter.

On Zombis:

Davis, Wade. (1985). The Serpent and the Rainbow. New York: Warner Books.

Coping in the Coming Radical-Humanist Paradigm



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CUSTOMER SERVICE UNIVERSITY

Major Rob Mann and MSgt Sheri Patton 20th Support Group

In 1993, Brigadier General John B. Hall, Jr., the Commander, 20th Fighter Wing, Shaw AFB, SC had a vision...the concept of a Customer Service University (CSU). CSU would be the vehicle of creating customer satisfaction the Shaw way: through caring service, courtesy, quality, and responsiveness. To launch this initiative, the Support Group Commander, Colonel Ronald T. Sconyers began formulating ideas. The first step was to establish an advisory body or "Board of Regents", composed of: the 20th Support Group Commander; an academic authority from Troy State University; the President of the Sumter Merchants Association; the Marketing Director for the 20th Services Squadron, and the Commandant, Customer Service University. The council would serve in an advisory capacity to CSU.

The most effective way to build the university was to begin research on similar institutions. An organization at Kadena AFB, Japan was our initial benchmark. We examined some of their course material and by doing so were able to better focus our own approach. Research began and the references we selected to use as the basis of our curriculum were: Managing Knock Your Socks Off Service by Chip R. Bell and Ron Zemke; Delivering Knock Your Socks Off Service by Kristin Anderson and Ron Zemke; and Service America by Karl Albrecht and Ron Zemke.

To begin awareness at Shaw AFB, Colonel Sconyers wrote an article for publication in the base newspaper, The Spirit. In that article, the central theme was based on an article by Karl Albrecht, titled, Government Service where he states, "typically government employees feel that there is no need for customer care, because there is no competition and our customers are basically have no where else to go. Getting a government organization to be really customer driven and service oriented is really like teaching an elephant to dance." In addition to the article, a letter was sent to all the group commanders announcing that the Customer Service University will be Shaw's way of creating customer satisfaction. Since the Support Group is made up of so many service oriented organizations, the Support Center in particular, we feel we are the trend setters when it comes to serving our customers. To bring that to Shaw's attention, a red carpet was laid on the entrance way into the Support Center building, with a sign that reads: "We give our customers red carpet treatment". To live up to that statement the teaching had to begin. In September 1993, the Commandant for CSU was hired to build the university.

The university is located in the Support Center building and the class consists of 15 students, intermixed from all the squadrons on base. This allows for effective crossfeed of information. Officers, enlisted, and civilians attend the course, however, our main concentration is to train the front-line providers first. The local community members consisting of local merchants as well as the general public are also attending the course to promote community relations. Framed posters with a flavor of quality and customer focus decorate the room. An alumni book has been made available to the students to browse through to see who has gone before them. Air Force

certificates are given to each graduate signifying their achievement as a "champion of customer service". In January 1994, the Board of Regents conducted a quality off-site to develop a mission statement for the university: "Customer-focused education creating customer service champions committed to improving the quality of life in the Shaw/Sumter Community." The Air Force News Service visited Shaw AFB in February 1994 and heard of our latest quality initiative. CSU was video taped during a class and the video tape is available for viewing throughout the Air Force.

Now that the vision and concept were identified it was time to start laying the foundation and build the walls to this university. The Commandant conducted research, attended a "Delivering Knock Your Socks Off Service" conference, presented by Kristin Anderson, the author of one of our often quoted texts, and also attended several seminars on customer service. The staff made contact with Performance Research Associates, Incorporated and received permission to use their material. To give the curriculum a flavor of government customer care, specific examples, scenarios, and the use of Air Force quality terms were incorporated and centered specifically around Shaw AFB.

The fundamental framework of our instruction is contained in the Air Force Quality Criteria, Category 7, Customer Focus and Satisfaction. This category examines the organization's relationships with customers, its knowledge of customer requirements and of the key quality factors that drive business environment competitiveness. Also examined are the organization's methods to determine customer satisfaction, current trends and levels of customer satisfaction and retention, and these results relative to competitors. CSU provides our customer servers a tool box filled with techniques based on the Air Force Quality Criteria.

Lessons plans were written and instruction began. CSU had two prototype classes in November and December 1993 and based on the students feedback and the experiences of the instructor, changes were made and CSU went full speed ahead in January 1994.

The curriculum is designed to give the students an awareness of why we feel it's so important to focus on our customers as well as provide them with the tools and techniques to effectively handle their customers and their requests. The two-day course begins with our 20th Support Group Commander, Colonel Steven S. Savage who gives welcoming remarks. The Commandant then takes over and discusses the background of CSU, goals and objectives of the course, and what tools the students can take away from CSU and apply across the base. The classroom is set up to facilitate discussion among the students. The best way to break the ice is for the students to make a new friend by interviewing the person sitting next to them--then they introduce their new friend to the rest of the class.

The second hour of the class is a pre test of role playing. The students are placed in teams of two and asked to create their own scenario of an irate customer and a provider. They can use something that has actually happened to them in their jobs. The purpose of the role playing is to see how they react as customers as well as observe the providers actions in dealing with their customers. Discussion and feedback is limited as they will post test the last hour of the second

day, after they have received instruction on how to handle customers as well as how to be a more considerate customer. The results are phenomenal.

"Shaw's target" is the next area of instruction. This lesson discusses attitudes and why they should start formulating a more positive attitude in their work environment so their lives can be enriched at work and also at home. The discussion is based on Karl Albrecht's article Government Service. We discuss the W.I.I.F.M. (what's in it for me) principle: (1) personal growth and satisfaction and; (2) because it's the way we should be doing business. Finally, we wrap this hour up by sharing with them "Ten Steps to a Successful Service Program":

Step 1 - A commitment to service

Step 2 - Listen to your customers

Step 3 - Hold everyone accountable

Step 4 - Training the leader

Step 5 - Train and trust the employees

Step 6 - Employee Empowerment

Step 7 - Measure

Step 8 - Recovery strategy

Step 9 - Celebrate success

Step 10 - Continuous renewal

This lesson gives the students a basic understanding of why CSU was created and how they can start building the walls on this foundation.

We feel that it's important for the Shaw populous to understand how the Air Force Quality Criteria, especially Category 7, Customer Focus and Satisfaction ties in with CSU. Major Mann, the 20th Fighter Wing Quality Advisor is a guest presenter at CSU on this topic. Many folks have only just heard of the criteria, and don't understand the concept at all. This hour gives the students some insight on the Air Force Quality Criteria and gives them a basic understanding of the development of our developing Quality Culture and the long term preparations being made for our Quality Air Force Assessment (QAFA). It orients them to the big picture of "Air Force Quality" and the importance of their roles as "champions of customer service".

Imagine having a discussion with an Air Force or civilian member, working at your installation, who tells you that he or she doesn't need to attend CSU because they don't have customers. Having the opportunity to be an assessor for the Wing's quality self-assessment, I discovered that most people don't realize who their customers are. To remedy this situation, CSU covers an area on "customers", the definition and the two types, external and internal. In discussing the internal, the staff concentrate specifically on the boss and coworkers. To make the picture even clearer for them the students complete a customer matrix. They identify their top three customers, list their customers needs, wants, and what they can do to "wow" their customers, for example, what is it that they can do to "knock their customers socks off", to dazzle them, to make them a raving fan. This has been a worthwhile exercise for the students based on comments such as, "I never took the time to think about who my customers are and what it is that I provide them." Why the "wow" column? This is our chance to tell the students that whenever

the opportunity presents itself, it is alright to go the extra mile for your customer. The effects of "wowing" your customers; greatly enhanced credibility for you and your organization.

First impressions are lasting. This first moment of customer contact is truly a "moment of truth" for the customer. The students are shown examples of positive and negative memorable experiences that can be given their customers from the moment they make eye contact, or from the first word uttered from their mouth on the phone. As providers, we are in direct control of these moments. The students are told that it makes no difference if it is the first customer or the one hundredth customer of the day, we need to treat each customer as though they are the most important human being in your life at that time. At the end of this lesson CSU provides the students with some additional pointers in creating a customer focused atmosphere such as: "the message of good service is extended beyond your office" in other words, developing (and enjoying) a good customer service reputation. One of the framed posters in the classroom reads. "It takes months to find a customer and seconds to lose one". This is pointed out to the students by saying our customers have to come to us for service because there is no elsewhere. So wouldn't we rather have them return wanting to do business with you instead of dreading having to meet with you again? The choice is ours, let's create "raving fans". There are also scenarios tied in with this lesson based on a customer receiving a service from a provider. The students analyze the situation and discuss what the provider could have done to make the encounter more pleasant for the customer, without breaking any laws, but just by taking out some of the bureaucratic nonsense and using common sense. The scenarios we use are close to home for all of us. For example; wanting to order a meal from the child's menu, or, getting the royal runaround at the CE self-help store; and on a more positive note, a Nordstrom's department store (well known for world-class customer service) example of employee empowerment. students can really relate to these and other Air Force specific examples of good and not-so-good customer service. They can relate from the customers perspective, and also from that of the provider!

To reinforce the message received on the first day, and to wrap up the first day, the students watch a film titled, "For Goodness Sake". The film is based on goodness, dozens of hilarious sketches, with Hollywood stars. The film covers four areas: (1) making goodness a value in your life posing the question, how would you want your eulogy to read? (2) obstacles to goodness--we rationalize, people think good guys finish last; (3) goodness in action--most people think they are good already. However, to be a good person you have to act. (4) feeling good about being good--goodness, like anything in life, will become a habit if you practice it enough. The film makes such good sense it makes you want to go out and do good. The students are encouraged to commit a "random act of kindness", per the film, after class and to share it with the class the next day.

On the second day, CSU plunges into a lesson titled, "You Are the Organization". The information provided addresses how our customers look at us--as the organization. We carry the weight of our customers perceptions on our shoulders and they want to hear what we can do for them, not what we can't do. Through our choice of words, our tone, and our nonverbal communication we communicate our organizations values to our customers. We become the organization. Telephone etiquette is practiced here and the students are shown many examples of

effective and ineffective telephone procedures and techniques. For example, how do you feel when you are placing a phone call and the person that answers says "hold please" and doesn't even give you a chance to say "yes, I'll hold, or "no I'm sorry I can't". Other information is provided on how to make the customers feel respected, heard, and understood. As customers, we carry with us an imaginary report card, (or an actual little black book), rating our perceptions of the service we receive. We call this the R.A.T.E.R. report card. The R stands for reliable; the A is for assurance; T is for the tangibles; E = empathy; and the last R is for responsive. To illustrate this, a student is asked to take part in a short skit where they become a supervisor. The tasking was for their employee to set up the squadron Christmas party and now the supervisor has asked to be briefed on the progress made. The skit is done twice. The first time done, the employee failed miserably on the report card. A second chance is given and the employee passes with flying colors, based on the five areas of this report card. This scenario shows the students how a tasking from your boss is satisfying a customer's request. The boss is your customer. The last area of this lesson is a brain storming session. The students are asked to reflect on someone that has provided them a service above and beyond the call of duty, or someone that has positively influenced them. These positive influences have specific traits that make them so good. As a team, we call out specific traits of people, for example, responsible, caring, fun, energetic, etc. After we place a couple dozen on the board, we point out that they can become a person like this by beginning to include these strengths into their lives--results will be a better provider and an opportunity for them to be a role model for someone else.

Having to take care of customers requires the students to carry around a tool kit. Often times we get into situations where we are at a loss for words or action. This lesson covers the options for saying no to your customers. This doesn't sound like customer service, however, there are times that federal law or some very stringent rules won't allow us to give the customer what they want. Rather than just saying no, we show the students a more effective way by using the approach of showing empathy or sympathy, this is the feel, then the felt, and then follow through with additional information method. For example, federal law prohibits the release of someone's medical record to just anyone without written consent. Rather than just saying, "Federal law won't allow us" we tell the students to use the feel/felt/information approach, "I'm sure you are disappointed, at one time I also thought anyone could pick them up, the reason for this law is to protect the patient, but this is how we can help you." The nuances in this approach will make a better impression on your customer than by just saying "can't do it." Then there are times when we run into snags in the system and we must recover. There are four steps to a quick fix that CSU shares with the students as well as a three-step framework for solving problems. One of the most effective ways to have your customers return as raving fans is to make them right. The slogan: Rule # 1: The customer is always right. Rule #2: If the customer is ever wrong reread rule #1. Our point here is the importance of educating your customer. Our natural tendency is to point fingers. Instead of using that approach, which gets you nowhere, we show the students ways to make their customers right by assuming their innocence, teach them, and give them the benefit of the doubt. The most important tool available in this tool box is the provider's ability to listen effectively to the customer. CSU wraps this lesson up by informing the students of the ten best ways to listen to their customers to prevent flaws in the system or to repair one that may already exist.

This has taken the students up to the lunch hour on the second day. They have been given many tools to effectively work with their customers. To keep it fresh in their minds, the students are then placed in teams of two and tasked to go out on base or in the community and be a mystery shopper. They are encouraged to use an errand as their mystery shopping excursion, to look for the moment of truth, and the overall service based on the R.A.T.E.R. report card as discussed. CSU emphasizes looking for the good not just the bad, and to give the provider feedback. They are encouraged to fill out a survey or critique to let the provider know how their service was. After lunch, the students report their findings to the class. The benefits to the students is an increased awareness of the service they are receiving as well as becoming a more considerate customer.

To add some variety into the instruction, a guest speaker, Peggy Boal from the Social Actions Office, who has had training in facilitating instruction on customer service, presents a lesson on "The Buttons That People Try to Push". There are two ways that providers choose to handle this: (1) react irrationally, or (2) react rationally. Through the use of our choice of words or by asking questions may turn this negative encounter into a positive one.

The final lesson for the course is "Dealing with the Dissatisfied Customer." CSU classifies the irate customer into four categories, blasé blue, ornery orange, raging red, and finally the prize fighter. Each color contains a handy guide for the provider on how to "repair" this dissatisfied customer. Instruction is given in; general people handling skills, how to allow the customer to vent, and how to use the customer to help generate the solutions. Scenarios are read and the students use a guide to determine what skills the provider used to handle this customer. Often times these encounters can be avoided. We provide the students with some tactics to avoid a confrontation. This is when you get the feisty customer who will do everything in their power to sink you as a provider. The provider must stay on top of the water and not get snagged by their bait.

Finally, the last hour of the course is set aside for the students to role play and "post test" their skills. They have had a great deal of information and practical tools and techniques given to them. Now they demonstrate the results of their learning through enacting skits of being a customer and a provider. Miracles do happen--the growth from the pretest to this hour is astonishing. Even the students whose pretests were observed that by incorporating the additional techniques covered in class they can turn the post test situation into a great customer service experience. For those students who needed more help initially, the results are none less than spectacular. The students have not only learned how to provide customer service that exceeds customers expectations, but they have also learned how to be better customers themselves.

The Customer Service University is doing great things. However, we need to measure our progress. CSU has trained over 600 students to date. The students are given surveys to complete. The results of those have been positive with comments such as:

"Maybe we should look into making this course as Air Force wide thing. It would help everywhere."

"I honestly thought this would be a boring class to attend. This was the first class I haven't fallen asleep in since I've joined the Air Force."

"I didn't realize how much I needed it. Working the same job all the time and handling mass customers, you forget that they do not know your job and just want answers. A real attitude adjustment for me! Thanks for the opportunity.

"Thunder is good, thunder in impressive; but it is the lightning that does the work." (Mark Twain). "I plan to be a lightning bolt. Personally, I feel that this class is long overdue or possibly right on time with our new QAF initiatives on line. This brings/creates a total picture/concept we are hearing into a new and improved Air Force where we care about our people as customers and as providers of services. I am proud to get on board of this new fast paced train."

"This course should be a model for all Air Force wide implementation."

"Learned a lot. After three and a half years of Military Personnel Flight experience, I didn't think I could learn much more about customer service. I was wrong. If not already done, suggest to other bases the curriculum of this class."

"The entire course was excellent. All aspects of the course were well explained and deep felt. I can honestly say it has made me more aware of myself and I'll be a better customer and service representative because of it. Although this was not something I was looking forward to, I am more than glad I came."

"Hurry, rush! Get Shaw personnel through this. It will be a tremendous help. Thanks."

"The civilian community could surely benefit from this experience. It gave us ways of handling our daily situations in a more productive, less stressful way."

"Honestly, I dreaded coming to this class. After two days of class, I didn't want the class to end. I can now say that I've taken the ticket and am on board of the train with the quality concept. Prior to the class, I didn't want anything to do with quality and was hoping that this concept would hurry and fade away. Now, I can see that quality needs to stay and that I want to be a part of it. The sooner everyone gets this training, the better off the world will be."

A post survey is now given to alumni and some supervisors of alumni. This is a measurement to show the benefits and improvements made after attending CSU. The results are from surveys conducted in May and Jun 94 for the alumni and supervisors from Jan and Feb 94. Using a "Likert" rating scale:

- 5 (significant improvement)
- 4 (much improvement)
- 3 (some improvement)
- 2 (slight improvement

1 (no improvement)

The key areas addressed with the averaged response is:

Alumni

- 1. Based on the feedback you have received from your customers since attending CSU, how much improvement have you made as a service provider? 3.4
- 2. Your handling of dissatisfied customers is: 3.9
- 3. You have concentrated on your telephone etiquette and would rate your skills as: 4.3
- 4. Did the Customer Service University impact your actions as a customer: 4.6
- 5. How has the Customer Service University influenced your rapport with your customers: 4.5
- 6. Would you recommend this course to your coworkers: 5.0

Supervisors

- 1. Based on customer feedback, how much improvement has your employee made in providing service: 3.8
- 2. Your employee's handling of dissatisfied customers is: 4.2
- 3. Telephone etiquette of your employee would be rated: 3.9
- 4. How has the Customer Service University influenced your employee's rapport with customers: 4.5
- 5. Will you send other employees to this course: 5.0

The CSU concept teaches Customer Focus and Satisfaction (Category #7, Air Force Quality Criteria) in an extremely, efficient manner and has been extremely successful in producing champions of customer service. It will continue to add real value at Shaw as the staff strives to improve it. The reputation CSU has established for producing results has spread throughout the base. The phones are constantly ringing with calls from officers, enlisted, civilians, and members of the community requesting additional student slots. CSU has turned out to be a highly productive and tangible quality initiative for Shaw AFB and for the Air Force. It is measurably improving the quality of customer service and the quality of life at Shaw AFB one customer at a time. We feel that the CSU concept can work anywhere!

CITATION OF REFERENCES

Bell, Chip R., and Zemke, Ron. <u>Managing Knock Your Socks Off Service</u>. Performance Research Associates, Inc., 1992

Anderson, Kristin., and Zemke, Ron. <u>Delivering Knock Your Socks Off Service.</u> Performance Research Associates, Inc., 1991

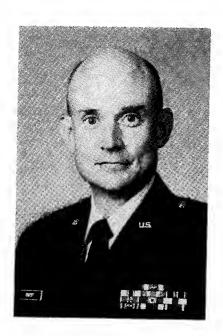
Albrecht, Karl., and Zemke, Ron. Service America. Warner Books Inc., 1990

Blanchard, Ken., Bowles, Sheldon., and Mackay, Harvey. Raving Fans. William Morrow and Company, Inc. New York, 1993

BIBLIOGRAPHY

Albrecht, Karl., At America's Service, Dow-Jones-irwin, Homewood, IL 80450, pp. 8-9

Future Possibilities: An Approach to Analyzing the Future



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FUTURE POSSIBILITIES: AN APPROACH TO ANALYZING THE FUTURE

by

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Abstract

This paper presents the results of an ACSC research team developing a methodology for exploring future opportunities. The effort was instructive in several areas. One revelation was most people fail to give the future much thought at all beyond mundane personal concerns. However, we discovered when we do begin to think about the future through asking questions, we can learn much about what the future may hold.

Introduction

When considering the many different possibilities the future holds, the first thing for anyone to do is begin by asking questions. In Joel Barker's book, Discovering the Future: The Business of Paradigms, he says the way to seek out a new way of doing things is to ask "What do I believe is impossible to do in my field but, if it could be done, would fundamentally change my business?"1 When considering various possibilities for the future, this is obviously a useful question. However, when it comes down to actually considering what things would be nice to do in the future the critical matter becomes asking the right question or series of questions. To deal with this issue we formed a research team at Air Command and Staff College to develop a methodology for discovering the right question, or questions, to ask of the future. In this research project we spent 6 months working on a methodology to question the future and discuss various possibilities based on those questions. During the course of our research / brainstorming, we discovered people in general spend very little if any time thinking about the future in any substantial way. We also learned how difficult it can be to "think outside the lines" and be creative, particularly while in an academic environment. Essentially when it comes to thinking about the future and possible courses of action, we found most people are afraid to take the risk that's involved. Thus, futuristic endeavors are in a real sense comparable to the existentialists' "leap of faith." Despite these rather negative discoveries our project produced what I believe is a credible technique for discovering future trends and preparing for the future. It is also a simple and effective exercise in creative forward thinking.

Looking For A Right Question

This research project began under the title "Present Impossibilities: Future Opportunities." The idea for this project came from Joel Barker's question, mentioned above, which for our purpose

¹ Joel Arthur Barker, *Discovering the Future: The Business of Paradigms.* (St Paul, MN, ILI Press, 1989) 74.

was to brainstorm ideas on things that are presently impossible, but if could be done would "fundamentally change [our] business." Our objective in this project was twofold. First we wanted to develop a methodology for asking the right questions about the future, and based on the questions focus on a specific area. Second, once we identified a key area through the use of the questioning technique, investigate what is needed in that area and analyze future opportunities for the Air Force and the Department of Defense. In carrying out the second part my initial thought was once we decided on some possible future options we could then work on ways to further develop them.

When I first started working on the concept for this project, my hope was to attract enough people to make up two or three groups of six to eight persons each. In each of these groups I had hoped to have a good mix of different services (Army, Navy, Air Force and Marines), backgrounds, and international officers. Each group could then brainstorm independently, asking questions about the future to maximize creative output. After these groups had conducted the brainstorming, we could then reassemble as a team to compare results and hopefully reach a consensus as to a key issue for the future. However, rather than attracting 18 - 24 volunteers required for two or three groups, in the end we only had the number of persons required for one group. While there were many inquiries into the project and considerable interest shown, the nature of the project was too vague for many students to feel comfortable. For this reason the students who did volunteer displayed considerable creativity and a commendable willingness to make that "leap of faith."

Our research group was composed of eight persons other than myself. From the ACSC student body were Majors Pearl Golden, Rebecca Seeger, Leslie Scott, David Harris, Robert Goldberg and a civilian, Sharon Rierson-Alsop. We also had the help of Tom Downs from the USAF Quality Institute and Captain Jeff Closson from Air University CADRE. These team members provided a fairly good cross section of the Air Force, representing such diverse fields as aviation, space systems, personnel and intelligence. As I had hoped these various perspectives significantly contributed to the creativity of the team.

Our beginnings were at best a little rough. My hope was to begin without any constraints or restrictions and dive into brainstorming questions about the future to get as many questions on the table as possible. The type questions I submitted as examples were: "What do we visualize the world to be like 20 - 30 years in the future?", "What are we afraid of?" and "What do we know for certain about the future?" What we found was serious resistance to approaching the subject without having a more clear objective. For the first two or three meetings we had to remind ourselves what our goal was and how we intended to reach that goal. Since it was apparent, we were working too far "outside the lines" for comfort, we spent two meetings agreeing on a clear objective and a clear timeline for achieving that objective. We formalized the objective in the following way: produce a methodology for analyzing the future and then based on using that methodology, make one concrete recommendation to the Air Force for the future.

Through our own trial and error we formalized the methodology in the following manner. Our thesis was that in order to arrive at the right answer it is imperative we ask the right question. This maxim applies to thinking about the future as it does to any other endeavor. To do this we discovered the first thing a group should do is discuss biases of the team members to increase our awareness of our own blinders regarding the future. We found our biases ranged from optimism to pessimism about the future as well as secular and religious biases. The next step we considered essential was to list our own expectations for the next 50 years after which we listed our non

expectations for the next 50 years. In this case we tried to see if there was a correlation between our expectations and non expectations. The result of this exercise was, it again exposed our own biases about the future. For example I'm somewhat of a pessimist so my list of non expectations included world peace, and continued prosperity, while my expectations included increased low intensity conflict and a world wide declining standard of living. Though we conducted these self assessments at the same time we were brainstorming questions, we felt it would be best in the future to begin the actual brainstorming after the self assessments.

As we began the brainstorming process, we wanted to use as many questions as we could come up with, so we invited outside input from family and friends and one informal survey at the 1993 USAF Quality Symposium. The results of informal surveys told us much about the way many people think about the future. We learned, in general, people don't seem to give the future very much serious thought beyond planning for the mundane, e.g. vacations, work, etc. I asked several persons "If you could know one thing about the future, what question would you ask?" The typical response was "I've never really thought about it." Furthermore, of 1000 surveys circulated at the Quality Symposium, we only received back 30. Of these 30 responses the questions, by and large demonstrated a rather shallow, self centered interest on the future. The typical response was something like "Will I still have a job next year?" The limited response and low quality of input revealed to us the overall lack of training we provide in teaching people to think about the future and develop foreword thinking.

Between our own sessions and some outside input we produced a list of about 120 questions, some of which contained multiple questions within them. In our approach to the questions we tried to think in terms of what is presently impossible and seriously consider not only the rapid advance of science and technology, but changes in the culture as well. Because we used the brainstorming method of generating questions, we did not in any way try to control the quality of the specific questions. For example some questions were along the lines of "Is there life on Mars?" or "Will space warriors receive space pay?" Additionally, we did not restrict the content of the questions to a specific area like airpower or military operations. In generating questions our thought was that we now live in a global community in which few things, if any, happen in isolation. We worked from the premise there is an increasing interrelationship between events and because of this there can be ripple effects felt in the most disparate areas from which the event occurs. For example, political scandals in one nation can cause stock market declines, not only in that particular nation but in others around the world as well. Thus, we looked for questions dealing with as many different areas as we could think of.

Our initial list of questions came to about six pages. However, the list grew exponentially when we began the process of categorizing and sub categorizing. The questions fell into seven basic categories: political, economic, information, military, technology, social structures, and environment. We found many of the questions fit into multiple categories. Then, when we began the sub categorizing we found that the questions again fell into more than one sub category. The sub categories were: international relations, leadership, national strategy, institutions, management, energy, resources, threats, science, medicine, ethics, population, education, demography, and culture. The following spread sheet shows the breakdown in the number of questions in each category and sub category.

	POL	ECON	INFO	MIL	TECH	SOC STR	ENVMNT
Int'l Relations	24	15	6	10	15	12	4
Leadership	12		1				
Nat'l Strategy	14		4	2		1	
Institutions	8	1	4			2	
Management	2	23	10	26	14	13	15
Energy		2			8		4
Resources		9		1	1		16
Threats				22			
Science					40		
Medicine					11		
Ethics					10		-
Population						5	
Education						13	
Demographics						20	
Culture						22	

figure 12

When we first began the project we expected the categorizing / sub categorizing process to produce a key question which would be easily identifiable. What we found however, was the process did not produce any identifiable key question, but revealed a central theme for considering the future. The theme that seemed to be interwoven throughout the process was information technology and management. We found that no matter which category we considered, information management had some bearing on that area. This process was much like looking at an Ishihara color chart covered with predominantly blue dots and some pink dots forming a

² Major Robert A. Goldberg and others, "Future Possibilities: Part I, A Methodology For Futuristic Planning," research paper, Air Command and Staff College, Maxwell AFB, AL, 1994, 44.

pattern within. Based on our discussions of the questions and the categorizing process, we had to determine what that pattern was. Moreover, we found it was unlikely a person outside our group would see this pattern by looking solely at the list of questions or the spread sheet. Only when someone works through the process does the pattern become evident.

Since all team members agreed information technology and management was the right area for us to focus on, the next step was to determine what we would like to do with information technology in the Air Force. Based on experience with information overload during the gulf war, our question boiled down to "What if we could develop an artificial intelligence that could receive raw intelligence directly from the source, then evaluate and organize the information in a cogent fashion along with recommended courses of action for the theater CINC?" Here again we sought to think in terms of what is presently impossible. Our thinking was if we considered only capabilities we now have, by the time we develop what we want it would already be antiquated due to the increasing pace in which technology is changing. In dealing with this question, we went on to ask other questions. Does such a computer already exist? Is it really possible to develop such intelligence? What is the expected benefit, cost, and time line? Could this be a threat to us? Using these questions we then began the second phase of our project.

The results of the second phase of the project go beyond the scope of this paper, however I believe the central question we developed validates this methodology as a viable means for analyzing future directions. Essentially, by using this methodology, we exposed ourselves to the future in its many possibilities in several different areas. By thinking about these various aspects of the future, we begin to see the elements that are entwined throughout the various categories and sub categories. In our case the greatest element was the inescapable prevalence of information technology and information management. While it is certainly true one could easily reach this conclusion without a methodology for studying the future, the actual value underlying our conclusion was an increased understanding of how and why information technology and management will have such a profound impact. There are also other themes we could have drawn out of the study. For example, as figure 1 indicates, management covers every category listed, while leadership is only listed under two categories. This would lead us to believe the impact of technology is resulting in a greater need for management to the detriment of leadership. Thus, we could have looked at the need for visionary leadership in the future and the impact if that need is not filled.

Another criticism that could be leveled against this project is that it is not scientific - only guess work. However, I would counter that when dealing with the future there can be no truly scientific analysis. Furthermore, with a good cross section of society as participants, the results should be a fairly good representation of the attitudes toward the future. These attitudes or outlooks can have significant bearing on the direction the future actually takes.

I would recommend this approach to future exploration with some modifications. Due to constraints of daily classes and different school shifts, we were limited to meetings that ran little more than one hour. We found in some cases just as we were beginning to produce good questions about the future, and engaging in provocative discussions, we had to adjourn. With a week long interval between meetings, it was difficult to pick up the discussions and brainstorming as we had left them. For this reason I would recommend setting aside a few days to a week to devote to the brainstorming process. Another area that seemed to hold the team back was the thought of working on an evaluated product. Because the students were concerned about the end result of the research project they were considerably resistant to working without a set structure

and guidelines. This, I believe, caused the students to hold back and adversely impacted their creativity. For this reason I would recommend using this technique in such a way that participants do not feel constrained by expectations. I believe the team will be considerably more productive if there is greater levity along with a free flow of ideas and questions. As noted earlier, through trial and error we discovered there is a best method, step by step approach to this exercise. We developed it into the ten step process which follows:

- 1. Establish a timeline for accomplishment of the project.
- 2. Identify objectives, customer(s), and mission statement.
- 3. Share personal biases on the future. The intent is to be aware of our own predisposition regarding the future.
- 4. Identify things not expected to occur in the future. By identifying these, you force yourself to consider the unexpected and therefore prepare for it.
- 5. List things expected to occur in the next 50 years. By comparing this list with the list of unexpected events, a scenario of what the future may look like begins to emerge.
- 6. Conduct creative brainstorming.
- 7. Distribute questionnaires. The purpose of these is to broaden the scope of the subjects the group is considering.
- 8. Comprise a list of categories and sub categories under which the "brainstormed" questions may be grouped.
- 9. Select specific topic(s) to be explored based on team reaction to the categorized subjects.
- 10. Research to identify what currently exists, what are the capabilities for the future, and how do we get there from here.³

Conclusion

Those rare persons who can anticipate things to come are typically the ones who pioneer new paradigms, and shape the future. Though few people possess this gift, I believe it is a skill people can, and need to develop. The methodology we built at Air Command and Staff College can be one way to develop this skill. If as a military organization and as a nation we are going to be ready for the future, we must be able to think more about it, to be "forward thinkers." As Yogi Bera said "I've seen the future and it ain't what it used to be." This comical statement has never been more true. Technology and changing global events are taking us on an ever ascending roller coaster ride for the foreseeable future. However, what if that roller coaster, for some reason, begins to descend? My conclusion is we must run to meet the future or like a giant steamroller, the future will quite easily roll over us. We can do this in two ways. First, if we analyze the direction in which the future is headed and we don't like what we see, we can try to change directions. Second, if we do like what we see, we can encourage the future on in the direction it's headed. Thus, I prefer running to meet the future. For if we can learn to run to meet the future by exploring it through questions and looking at the possibilities, it's more likely we'll be able to create our future rather than being overcome by someone else's.

³ Ibid, 12 - 13.

Improving the Process Improvement Process



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IMPROVING THE PROCESS IMPROVEMENT PROCESS

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ABSTRACT: This paper discusses various team process improvement processes and recommends some changes and enhancements. First discussed is the Air Force Quality Institute's Continuous Improvement Process model. The strengths of this model lay in the checkpoint concept and its grounding in the Shewart Cycle. Its weaknesses are the ambiguity, complexity, and non-applicability of some checkpoints. The Continuous Improvement Cycle model of Air Combat Command is also examined. This model's strengths are its simplicity and wide-range applicability. However, it could be improved by differentiating between problems and processes, and adding detail in the form of checkpoints. The author proposes a Next Generation Process Improvement Process which overcomes the problems of the two models previously cited and also incorporates their strengths. The main steps within the model are: (1) Clarify Process, (2) Identify Barriers, (3)Identify Causes, (4)Identify Solutions, (5)Action Plan, (6) Implement Improvements, and (7)Evaluate. The concept of solving one problem at a time is incorporated into the model as well. The improvements over earlier models make the Next Generation Process Improvement Process easy to use and more applicable for Air Force use.

Over the past year-and-a-half, I have gone from "zero knowledge" about the Quality concepts in this world, to the position of being at "ground zero" when the Group Commander needed someone to honcho Quality Air Force (QAF) implementation plans for our Group. I thought of myself as a worthy candidate because, like many other people, I felt I used a few Quality techniques in my management style. I'm afraid the truth is I fell far short of the ideal manager (and still do) because of the first cardinal rule I found out about Total Quality Management (TQM): the principles and techniques of TQM are a lot easier to preach than they are to practice. The experiences I had as the QAF Program Manager in my organization were similar to my personal experiences in that teaching and preaching were far easier than actually doing. Our "Quality culture" implementation moved along well for the first year until outside forces finally dictated the inevitable drawdown of the Group after years of mixed signals. Because the role of QAF in a "restructuring" organization is unclear, QAF was relegated to a back seat. Nevertheless, QAF guided our Group on a path towards several marked improvements over the past year or two and taught me a lot about the improvement process efforts in teams along the way. It is those lessons learned about the team improvement process I would like to share with you.

One of the biggest roadblocks that hindered the early blossoming of QAF in our Group was the number and complexity of TQM plans out there. The Air Force has come a long way in that battle by organizing its own version of Quality, called QAF, and establishing the Air Force Quality Institute (AFQI). This organization helps the Air Force by sifting through and sorting out good, applicable ideas. The AFQI then "hands over" to us these materials and techniques that took weeks, months, and even years of struggle by various organizations within the Air Force and civilian community to learn. I am very pleased in this respect with the Quality Institute's role in QAF. Their models and tools are very helpful. One of the Quality Institute's invaluable models is

the QAF System. This model helps to facilitate understanding of the QAF version of Quality in organizations by breaking down the complex interrelationships between leaders and workers and explaining their responsibilities and place in Quality. There is one process model, however, which is not the best it could be. It is a process on which I feel qualified to give my improvement suggestions. I am speaking of the Improvement Process part of the QAF System and the Continuous Improvement Process (CIP) in specific. That is the subject I would like to address in this paper.

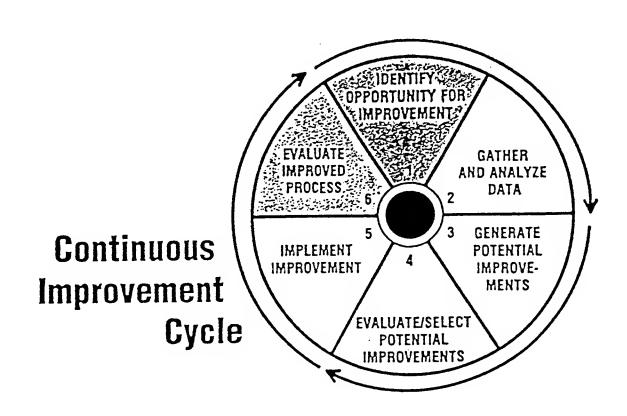
In the early days of implementation, I taught TQM Awareness courses to try to spread the word about Quality. When Air Force leaders changed the name of the movement to QAF and mandated its use throughout the Air Force, I continued to teach and learn. I received training in team member, team leader, facilitator, master facilitator, strategic planning, and Quality implementation courses from both commercial contractors and our base Quality Office. Most everything the instructors said made perfect "common" sense to me except the process used by these so-called Process Action Teams (PAT) in the Air Force. Though the steps in the process were spelled out on paper, they left a lot assumed and unsaid. It's somewhat like telling a 5-yearold that one of the steps in getting ready for bed is to take a bath. The step is right there, spelled out in black and white, but there is a whole lot involved in the "take a bath" step that needs to be spelled out to a beginner in order to be performed correctly. During my Air Force training in QAF teams, I felt the lesson plans focused inordinately on the "touchy, feely" part of facilitating (personality inventories and bad behavior-busting techniques) and not enough on the process. The details of how to get started (charters, team member selection, etc.) were spelled out clearly, but once that part was done the "road" became less distinct. Continuing the road analogy, we were all packed, ready for a trip, and knew where we were going. We were also well-prepared for the sights and attractions we expected to experience along the way (like non-participative or overbearing members), but the route on the map was very vague. Process Action Teams need an easy-to-follow, precise map. There may be more than one route to get to a destination, but the main route must be well-marked so the PAT can eventually get to where it is supposed to be. In a PAT. I call this easily discernible route to any improved destination a Process Improvement Process (PIP) because PATs use a process to improve processes. There are dozens of PIPs out there and they go by dozens of different names. Some are called Continuous Improvement Process, some Continuous Improvement Cycle. Others are simply called a Problem-Solving Process whereas others have a name so big, even the acronym is long, like FOCUS PDCA. Whatever the name, they are all processes for improving processes, thus they are all PIPs.

In an effort to start improving the processes within the Group, our Quality Council chartered a PAT in late 1992 with me in the role of facilitator. Little did I realize that every step along the way would be fraught with many false paths the team would inevitably be drawn to explore. These paths were not the highways to Quality. These paths became a problem when it was often days or weeks before we realized the error of our ways and had to go back to where we had taken the wrong turn and begin again from that point. Since there was no one available locally with the experience of an entire PAT under their belt, help was an educated guess at a concept; a "try and see if this works" approach. To make matters worse, every book I picked up recommended a different approach or method to use. Over the long run, I found a few simple steps that all good PIP models have in common. I look at these steps as my road map. Don't get me wrong, there are many different byways to take on the journey toward true process improvement. A good PIP will allow a team the latitude to improve any type of process, yet not

lose sight of the main highway and get lost in the jungle of numerous PIP steps and wrong turns out there. A good PIP won't dictate every little detail of the journey, only highlight the true route and the associated road markers. In light of subsequent PAT successes in my experience, I would like to offer a few helps and suggestions that have helped me along the road to Quality.

The level of QAF knowledge and experience the average team leader or facilitator has is still minimal at this stage of QAF implementation in the Air Force. For that reason, the plans or road map a team follows needs to be simple, yet helpful. This will not only reduce the amount of confusion and frustration felt in many teams but also enhance the level of confidence and enthusiasm for using this process. The basis of any improvement process or system should be the Shewart Cycle (Deming Wheel) concept of continuously studying the results and improving the process. I think everyone would agree on that point. In fact, the model of the Quality Institute's improvement process as outlined in the book, The Quality Approach, has as its center the Shewart Cycle. Also, incorporated into any PIP model has to be the rudimentary philosophy of progressing from problem, to cause, to solution. This subtle, yet powerful concept needs more emphasis when teaching any improvement process or PIP. Let us examine the Quality Institute's PIP, called the Continuous Improvement Process (CIP), which they advocate be used by the entire Air Force.

THE AFQI CONTINUOUS IMPROVEMENT PROCESS (CIP) MODEL



The Continuous Improvement Process model has 7 steps which, although basically sound, include 38 checkpoints that have some problems. A PAT does not perform all of those checkpoints while improving a specific process. A quality council would perform the balance of those with the entire organization in mind. Putting checkpoints in the CIP that a team would not use is confusing not only to the novice but to the seasoned facilitator and team leader as well. Here is a list of the checkpoints that need correction:

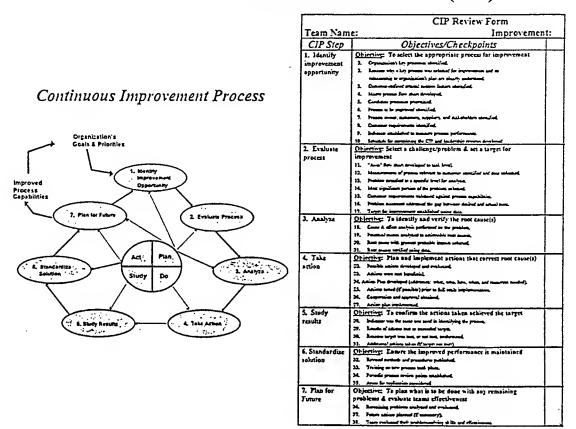
- -- "1. Organization's key processes identified." This is not the job of a PAT and should not be included in the road map a PAT uses.
- -- "2. Reasons why a key process was selected for improvement and its relationship to organization's plan are clearly understood." Checkpoint for a quality council to do, not a PAT.
- -- "3. Customer-defined critical success factors identified." This is the job of the PAT in the "customer requirements identified" step.
- -- "4. Macro process flow chart developed." A quality council task in the strategic planning process.
- -- "5. Candidate processes prioritized." Again, not a PAT concern. The priority would have been worked out before now.
- -- "6. Process to be improved identified." This is the last checkpoint on this model a quality council performs before the PAT takes over and thus should be dropped from the PAT roadmap.
- -- "10. Schedule for completing the CIP and leadership reviews developed." This step is really a quality council task because they know the priority of the problem in relation to the big picture. The council will establish a paradigm or norm in the way the organizational PATs report to the council, not the other way around.
- -- "36. Remaining problems analyzed and evaluated." An important omission in the CIP model is the concept of identifying causes and solutions to one problem (barrier, opportunity for improvement, etc.) at a time when analyzing a process. After identifying solutions to the first problem identified, the team should go back to the next problem within that process until all problems are dealt with and solved. Only then can the pool of solutions be evaluated by the PAT using criteria they compile within guidelines set forth by the process owner. This may be what checkpoint 36 is getting at, but I don't think so. Is it referring to the next process? If so, this is not the task of the PAT, but the quality council.

AFQI's CIP is NOT simple. The paradigm of setting up checkpoints within the steps of a PIP is very good. However, some of these checkpoints are duplicates of the Quality in Daily

Operations model and are not done by a PAT. Others are either too complicated, do not apply, or are inadequate to serve the purpose of a simple, concise road map for a PAT.

The Xerox Corporation made public domain an excellent PIP which Air Combat Command outlines in their Quality handbook, <u>Forging the Future</u>. They call it their Continuous Improvement Cycle. Without going into all the pluses and minuses in detail, this model meets most of the criteria necessary for a successful PIP paradigm for the entire Air Force.

THE ACC CONTINUOUS IMPROVEMENT CYCLE (CIC) MODEL



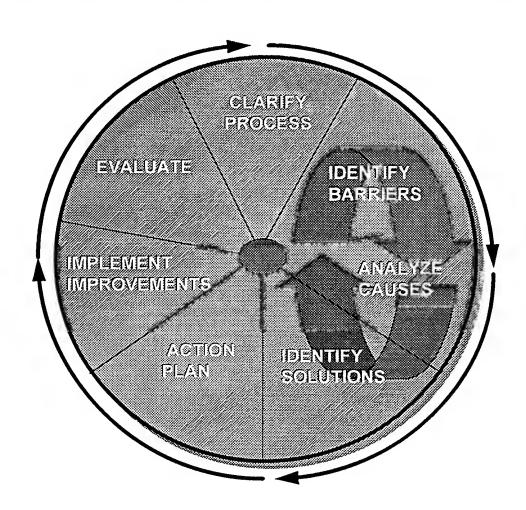
These are the things I would change about the CIC:

- The first step of the Continuous Improvement Process is "Identify Opportunity for Improvement." This statement does not easily allow for differentiating between the process and the problems within that process. It may seem subtle on paper, but in reality a PAT can get off on a confusing tangent not knowing whether they are identifying different processes with problems or identifying different problems within a particular process. As if that were not enough, it takes an experienced eye to tell the difference between causes, problems, and symptoms. The opportunity statement should be incorporated into a problem statement as the desired state in a step dedicated to identifying problems or barriers and left out of the process identification step altogether.

- Like the Quality Institute's CIP model, the ACC model does not visibly incorporate the notion that the problem-cause-solution sequence of events must be repeated for every single problem identified within a process.
- Although the "main route" on this map is clearly discernible, it doesn't incorporate standard road markers or checkpoints to go along with it like the AFQI's CIP does.

If the bugs were worked out of ACC's Continuous Improvement Cycle, it would work great as a standard road map for most Air Force PATs to follow when improving processes. The CIC model needs something to help folks visualize solving one problem at a time to follow the problem-cause-solution concept. Then add another step to differentiate between process and the problems within that process. I would also add some checkpoints to help clarify and give road markers to weary travelers along the route of process improvement. For the purposes of this discussion, let us refer to this modified model as the Next Generation Process Improvement Process. The Next Generation PIP is how I think the CIP and CIC will eventually mature and could serve as a framework for the Air Force's improvement efforts.

NEXT GENERATION PROCESS IMPROVEMENT PROCESS



NEXT GENERATION PROCESS IMPROVEMENT PROCESS STEPS AND CHECKPOINTS

STEP 1: CLARIFY PROCESS	 charter finalized with process owner, customers, suppliers, and stakeholders "As-is" flow chart of process and barriers developed Customer requirements identified Install process metric
STEP 2: IDENTIFY BARRIERS	 5. Identify barriers to process improvement 6. Put prioritized barriers in problem- statement format 7. Identify measures to indicate performance (incorporating targets)
STEP 3: IDENTIFY CAUSES	8. Analyze data to identify and verify causes to barriers
STEP 4: IDENTIFY SOLUTIONS	9. Generate solutions to causes
STEP 5: ACTION PLAN	 10. Generate final solution set 11. Optimized process flow chart developed 12. Verify process measures and establish review dates 13. Develop action plan
STEP 6: IMPLEMENT IMPROVEMENTS	14. Brief process owner (quality council)and obtain approval15. Action plan implemented
STEP 7: EVALUATE	16. Review process using measures and process metric17. Return to step 1 if targets not met

NEXT GENERATION PROCESS IMPROVEMENT PROCESS CHECKPOINTS EXPLAINED

STEP 1: CLARIFY PROCESS

- 1. This model includes only the steps and checkpoints a PAT performs. Some may argue the first two checkpoints are performed by the quality council or process owner and team leader before the PAT is even formed. This may be true in part, however, the PAT must internalize the words on the charter and if any clarifications or modifications are needed, this step provides that opportunity. The team must understand what their mission is and the boundaries they will operate within. Ideally, most of the PAT members work inside the process they are trying to improve. Their unique viewpoint will generate many questions that may cause the charter to be revised. The PAT must affirm its members' concepts of the people or positions identified as customer, supplier, stakeholder, and process owner. This will lead to a better understanding of the people and positions involved.
- 2. The "as-is" flow chart is one of the most important steps the team will perform because the team will gain insight into the current process while completing this checkpoint. Even though the task is to simply record the process to be improved on a flow chart, problems or barriers with the current process will become evident in the ensuing discussion. Do not discuss the barriers at length now. That is the task in step 5. Simply list the problems and go on for now. At this point, the boundaries of the charter will be discussed again as any sub-processes or overarching macroprocesses are identified. Further clarification from the process owner may be needed unless the charter was insightfully definitive. The charter is a living document and if it has to be revised after these two steps are done, then so be it. (The "flow chart" and "action plan" checkpoints are the only ones that specify a tool. At first this may seem inconsistent, but I believe that as a result of natural evolution they became synonymous with the step. These tools always seem to be the best to use for their respective purposes. If there is another tool that works better, it's probably a variation of either the flow chart or the action plan.)
- 3. The next task is to identify the customers' requirements--both internal and external. In this checkpoint the team will gain a perspective of their process from the outside and may end up doing interviews, surveys, and having guests speak to the PAT. A list of the customers' requirements is the tangible, desirable outcome of this checkpoint.
- 4. If the process does not have an overall metric the process owner uses to evaluate the overall health of this process, one should be identified here while the team is focused on the "big picture." The two most important tools to help the PAT identify this metric are the preceding checkpoints: the "as-is" flow chart and the list of what is important to the customer. If a metric was not identified and used before this point, it is too late because monitoring old measures now is pointless. Your measurements will not be reliable because of another cardinal TQM rule I discovered: PATs will inevitably start improving a process just by studying how to improve it. Why? Because of the increased understanding of the process and the cross-functional communication now taking place within the PAT. So your PAT may install a metric at this point but beware: any conclusions based on this data are suspect.

STEP 2: IDENTIFY BARRIERS

- 5. Identifying barriers to process improvement (or problems within the process--the concepts are interchangeable for our purposes) is the next checkpoint. There is an abundance of tools for this purpose, so use them to make PAT meetings interesting. This should be a relatively easy step because a lot of the barriers were listed while the PAT was doing the "as-is" flow chart in Checkpoint 2. Stating the problems objectively in problem-statement format will help your team visualize what they need to do. (Problem-statement format includes several criteria: a concise statement about the problem in "as-is" and "desired state" terms and stated objectively. A quantifiable statement with no implied causes or solutions included.)
 - 6. Prioritize the problems or barriers so you know which to work first.
- 7. Once the barriers are all laid out, some of them will be identified as constraints in the process. (Constraints are those critical points in a process where most functions must funnel through to be accomplished. If you experience a breakdown at the constraint point, everything else comes to a screeching halt.) Measurements should be installed at that point. In the real world, there won't be very many problems you can easily measure but only a very few are really needed anyway. Those that can be measured should be. It will help you prove objectively to the process owner you have improved the process. These measures should incorporate targets the PAT thinks are realistic and will solve the problem.

STEP 3: ANALYZE CAUSES

8. In this step, at this checkpoint, the team identifies the causes of each barrier. Again, there are many tools, but the bottom line is to be sure all possible root causes are addressed. Use the measures identified in Checkpoint 7 (step 2) to gather data to identify and verify causes.

STEP 4: IDENTIFY SOLUTIONS

9. The purpose of this checkpoint is to ensure your PAT generates solutions which address every identified cause. You may prefer to call these solutions "improvements." In either case, the basic concept is the same. Now go back to the next barrier (problem) and complete the problem-cause-solution cycle until all are addressed.

STEP 5: ACTION PLAN

- 10. The PAT now combines all the solutions (pooled from each problem-cause-solution cycle), then filters and prioritizes using Quality tools to come up with the final set of recommended solutions for the process owner to approve. Realistically, some filtering will have already taken place prior to this point as the PAT recognized the solutions to one problem worked to solve subsequent problems as well.
- 11. If one of your problem-cause-solution cycles did not include making a flow chart of the optimized process, it should be done now after all suggested improvements have been boiled down and before the team continues to finalize the solutions.
- 12. The team now assesses the measurement points for validity and to find out how often to take these measurements. In addition, the team's suggested improvements may lend themselves

to other measures which may be substituted or added at this point. As stated earlier, the key is to measure only those few constraints in the process, not just to add measurements for measurement sake. Be sure to assign OPRs to the measures because they are a job in themselves!

13. The action plan with tasks, dates, points of contact, and other information is formulated now and ready for process owner review.

STEP 6: IMPLEMENT IMPROVEMENT

- 14. Using the Next Generation PIP steps as an outline, brief the process owner to obtain approval. The solutions should not come as a surprise to the process owner. Periodic briefings to the process owner (and quality council if appropriate) along the way would have allowed the process owner to guide the general direction of the PAT so the team does not stray far from the objective. These updates are especially useful if the solutions are somewhat unorthodox because the process owner will have followed the thought process and won't be totally blindsided. Be sure the process owner commits to reviewing the metrics and measures personally. This ensures the right amount of emphasis is placed on those reviews.
 - 15. Implement the approved action plan.

STEP 7: EVALUATE

- 16. Review the process measures to ensure you are meeting the targets the PAT established. Begin to put some credence in the process metric from here on out. You have installed your changes and, based on their complexity, they should begin to change the process for the better as time goes on.
- 17. If your targets are not immediately achieved, do not panic. However, after a reasonable amount of time you may find that either your targets were not realistic or your improvements were ineffective. If your targets were not realistic, then the process owner should help the PAT determine more appropriate targets to evaluate the improvements. If the improvements were not effective, then it's time to return to step 1 and find out what went wrong.

In conclusion, the Air Force needs a simple, comprehensive PIP that is simple for any team to use, regardless of experience level, background, or organization. This needs to be a major concern of the Quality Institute since any organization's QAF improvement effort depends heavily upon team successes. The Next Generation Process Improvement Process incorporates the best of existing PIP models and improves on their shortcomings to meet those criteria.

Works Cited

- United States Air Force. <u>The Quality Approach...Your Guide to Quality in Today's Air Force.</u>
 Air Force Quality Center, 625 Chennault Circle, Maxwell Air Force Base Alabama, 36112-6425.
- United States Air Force. Forging the Future. Air Combat Command Quality. ACC Quality Improvement Office, Langley Air Force Base, Virginia, 23665-5191.

Institutionalizing the Quality Philosophy at the Defense Systems Management College



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PHOTO NOT AVAILABLE AT PRESS TIME

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Institutionalizing the Quality Philosophy at the Defense Systems Management College

Dr. Mary-jo Hall and Brigadier General (Sel) Claude M. Bolton, Jr., USAF

Abstract

Institutionalizing the quality management theory and philosophy is the first priority at the Defense Systems Management College (DSMC). This implies strategically implementing cultural change to focus on customer requirements, managing processes proactively rather than reactively handling crises, using measurement and data to make decisions about processes, and enabling employees to develop skills needed to empower themselves.

During the last 18 months, the approach at DSMC included setting the strategic direction, blueprinting the overall strategy for the journey, developing and implementing a Quality Improvement Plan, launching strategic process management using teams, and orienting the entire workforce on the quality journey with a 4-hour overview.

Introduction

"The question on which the future of your organization depends is not what do you understand about service/quality implementation, but what are you doing about it?"

--Jim Clemmer Author, <u>Firing On All Cylinders</u>

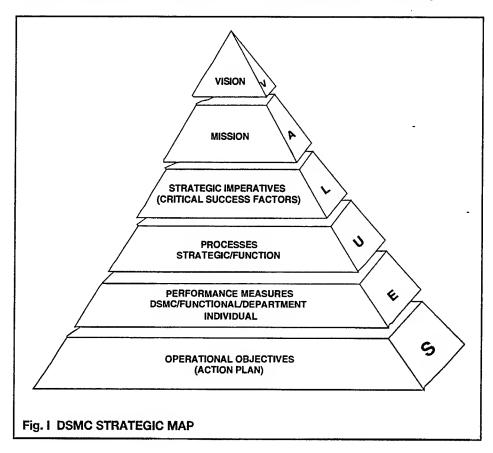
In April 1993, the new Commandant Brigadier General (Sel) Claude M. Bolton, Jr., USAF, set the priority of institutionalizing the quality management philosophy at DSMC. He adopted a three-pronged approach to the institutionalization. The first was to get quality into the classroom and to investigate new learning theories. The second was to teach quality principles of management. The third was to practice quality in all administrative processes. This paper focuses on the third prong.

One of the first steps for building quality into the administrative processes was to hold an offsite with the top leadership. The purpose of the offsite was to develop a strategy for quality implementation by analyzing the vision, values, mission and long-range goals. During the 3-day session, the vision was rewritten. The group reconfirmed the existing mission and Long Range Goals, articulated the values needed to create an environment for productivity and developed six Strategic Imperatives. These imperatives or critical success factors are what must be done in the short term if quality is to be institutionalized. From this beginning, an overall blueprint was developed to serve as our roadmap.

Knowing DSMC had put much time and money into the quality transformation, a key objective was to capitalize on the past gains but also to learn from our mistakes. Institutionalizing a new management system requires developing an infrastructure to support the desired system so DSMC business practices reflect the quality paradigm regardless of the change in leadership. Another objective was to develop processes and policies to support the infrastructure. The infrastructure, processes and policies are driven by customer requirements.

The roadmap adopted by DSMC is based on extensive research and review of other organizations. It is modeled after several generic models including Jim Clemmer's as expounded in <u>Firing on All</u>

<u>Cylinders</u> and facilitated by our consultant partners, Zenger-Miller/Achieve; the Quality Air Force model depicted in <u>The Quality Approach</u>; and the works of David Langford and Myron Tribus. The roadmap is strategic in nature and incorporates a focused, disciplined approach to improving all processes. It aligns actions with the strategic planning process as shown in Fig. I.



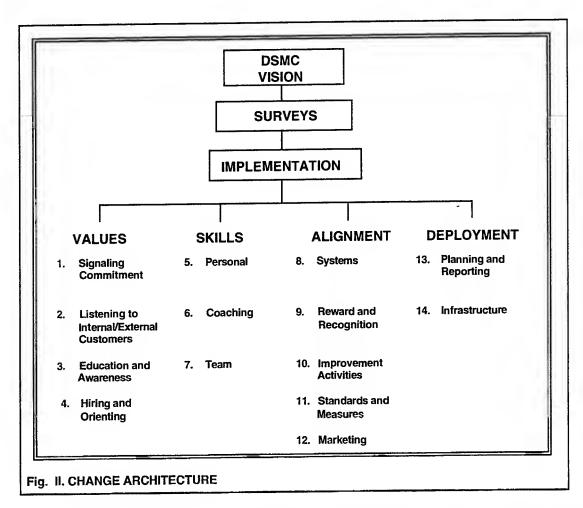
Leadership Team

In May 1993, the Commandant determined DSMC would have two parallel leadership groups. Heretofore, the Corporate Board had been "the leadership." However, based on research of other organizations and the history of DSMC efforts, it was decided that the Corporate Board would continue as the decision-making body and the Leadership Team would focus on processes, metrics and empowerment of the members.

The Leadership team consists of the Commandant and the Provost, Division Directors, Human Resources Council Chair, Corporate Planner, Senior Enlisted Advisor, Special Assistant for Quality, the Division Coordinators, and the Assistant Dean, PMED.

Quality Improvement Plan

The DSMC Quality Improvement Plan was drafted at a 2-day "Academy" that was attended by five DSMC members who represented several departments. The heart of the Quality Improvement Plan is a 14-cylinder service/quality implementation architecture (Fig. II) for improvement activities, called the "Action Plan."



To develop the Action Plan, the working group used brainstorming to create a Systems Progress Chart for eight constituent elements that define the quality philosophy. These elements are the attributes of an organization that practices the quality management theory. These elements include: customer focus, systems perspective, process orientation, continual improvement, an enabled workforce, team work, leadership commitment, and constancy of purpose.

Using the System Progress Charts, the elements of quality were overlaid on the cylinders of the architecture. For example, "customer focus" fits under #2, "Listening to Internal/External Customers," and systems perspective fits under #8, "Systems." To finalize the Action Plan, the group brainstormed specific activities, responsible agents and target dates for each cylinder. A draft Action Plan was discussed, modified and changed by the Leadership Team during separate meetings. Ratification was completed in November 1993. The Action Plan activities are reported on at Quarterly Reviews.

Based on our experience with the Year-1 Action Plan, several changes were made for the Year-2 Action Plan. The first was to get the Leadership Team more involved in developing the action plan. In order to do this the Year-2 offsite was restructured dramatically. The second objective was to use the Baldrige Criteria as the basis of the System Progress Charts. This approach is more integrated with other activities than using elements from the Year-1 plan. An example of how the criteria translates into the implementation architecture is as follows:

Baldrige Criteria	Architecture Category	Architecture Component
Role of Senior Manager	1.1	Signaling Commitment
Quality Values	1.2	Signaling Commitment
Public Responsibility	1.4	Signaling Commitment

Strategic Process Management

A key component of quality is managing and continually improving processes.

All work is part of a process - a series of activities or steps that produces an output of some kind, (a product or service). The more definable, repeatable and predictable the steps are (a) the more manageable the process, (b) the more uniform the outcome, and (c) the easier the improvement of the process and, therefore, the product or service. (Strategic Process Management: Executive Strategy Session Participant Workbook.) Emphasizing processes implies a strong focus on how work is done rather that what work gets done.

Every organization has hundreds, if not thousands, of processes that connect to, or fit inside other processes. Many are small, like the process for reserving a meeting room. Others are larger like holding a short course at a region. A few are large and complex, like the process for designing and developing a new course. Strategic Process Management (SPM) focuses on the key processes in an organization. Strategic processes literally define the organization and are cross-functional. The few processes that are customer satisfaction drivers, revenue generators or major cost centers.

This SPM approach is grounded in these basic beliefs:

- Organizations may be structured vertically but most work takes place horizontally.
- All work processes are made up of definable, repeatable and predictable activities.
- If a work process cannot be measured, it cannot be managed effectively.
- Effective work processes depend on involved, empowered, skilled employees.

Strategic Process Management includes focusing on what is most strategic for the organization and then documenting, monitoring, standardizing, improving and possibly pursuing innovation for the strategic processes. The SPM is concerned with customer requirements, cycle time, better products and services, as well as lower costs.

In a February 1994 meeting, the Leadership Team used brainstorming, affinity process and multivoting to determine the strategic processes at DSMC, therefore providing "focus" for the entire organization. These strategic processes include:

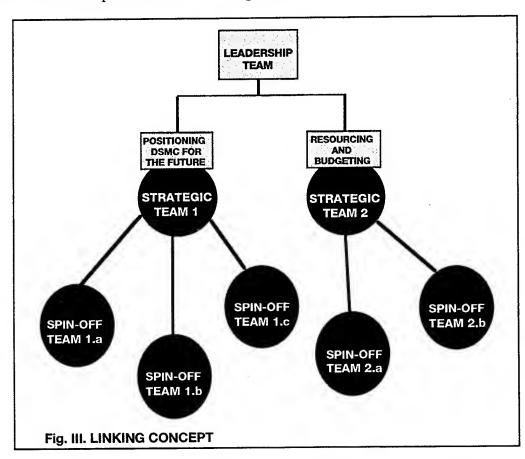
- Positioning DSMC for the Future
- · Resourcing and Budgeting
- Educating Research and Development (Course design, curriculum development)
- Educating Manufacturing (Execution of courses)
- Individual Development
- Cultural Transformation

The first two were chosen as those needing to receive the most attention. Executive sponsors were identified for these two processes. The "Positioning Process," which includes marketing, has surfaced during previous corporate offsites, but a process was never developed. The "Resourcing and Budgeting" process will be defined and reviewed for improvements.

Strategic Teams

Strategic Process Management relies on a series of interrelated teams to standardize and document the process and make improvements. These teams link the senior leadership with the people working on the process. Some exist. A Strategic Team is created for each strategic process identified for improvement. This group of people represent different functional divisions and are organized to manage the strategic process horizontally. The Strategic Team members are appointed by the Leadership Team and are empowered to "own" the strategic process. They are accountable for improvements. The two strategic teams at DSMC were launched during an intensive 3-day offsite in April 1994. At the offsite, the teams drafted the charter, blueprinted the process, and defined all interaction among the different divisions and the processes.

If the Strategic Teams identify specific improvement opportunities, theory appoint spin-off teams to work these opportunities. The spin-off teams are responsible for improving a subprocess within a strategic process. These may be permanent or short-term teams. The leader of the spin-off team is a member of the strategic team. This tie, along with the executive sponsor, link the improvement efforts to the Leadership Team as shown in Figure III.



At monthly sessions, the Leadership Team monitors improvements. The SPM teams use the Quality Improvement Story (QIS) methodology to report status. The QIS is a communications tool which displays the logic and rationale inherent in the improvement process.

Training

For the teams to work together effectively identifying processes and solving problems associated with them, team members need education in quality theory and skills training in tools and techniques. Skills needed include (1) technical skills, (2) data-based tools and techniques to improve processes and reduce ricochets, and (3) interpersonal people skills.

The technical skills are specific to each position and addressed in each team member's Individual Development Plan or job description. The data-based tools and techniques and interpersonal or people skill requirements are generic and cut across functional departments, positions, etc.

Skills using data tools and techniques is necessary because the quality theory of management is a "fact-based" approach. Its aim is to get at the root cause of problems in order to reduce variability in the system. The basic tools used for data are published in the <u>DSMC Process Improvement Guide</u>, which is distributed to everyone. Additionally, for two years DSMC has sponsored the <u>Total Quality Learning</u> 4-day seminar to practice these tools. This seminar is facilitated by David P. Langford. More than 290 people have attended so far.

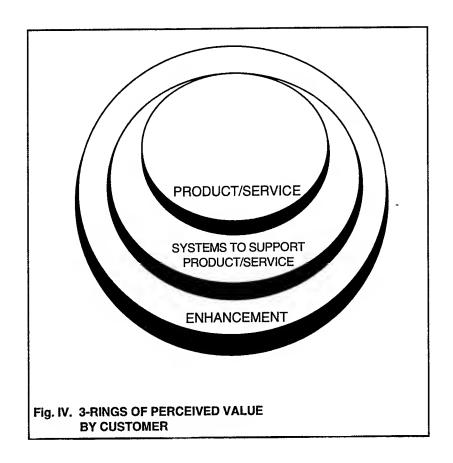
Critical to understanding the importance of training is this simple concept: if an organization does not provide training by design, it provides training by default. Clearly then, since DSMC is dedicated to continual improvement, training is a way of life; it is an ongoing developmental and goal-oriented activity whose structure permeates the organization.

The SPM teams have Just-in-Time modular training available to assist in learning interpersonal, team skills and specific tools and techniques. These 4-hour modules from Zenger-Miller/Achieve are facilitated by in-house discussion leaders.

Organization Orientation to Quality Journey

Besides discussing the DSMC quality management system at quarterly Commandant's Calls and at meetings with individual departments, the College implemented a 4-hour orientation seminar for all employees. The seminar, "Quality - Through the Eyes of the Customer", was directed at raising employee awareness about what is involved in quality management at DSMC, as well as developing common terminology and discussing the Improvement Plan. The seminar examined how customers judge the product service or quality in terms of the three rings of quality. The inner ring is the basic service, the middle ring includes the systems and services that support the product or service, and the outer ring represents the enhanced service that people provide. (Figure IV) Each seminar featured a dean, the provost or the commandant who discussed why we were on the journey and a quality coordinator who discussed the Quality Improvement Plan and training opportunities. The seminar participants provided feedback to the leadership on how to keep the journey moving.

The discussion leaders for the seminar were the same members certified to facilitate the Just-In-Time modular training. Concepts were explored using video tapes, case studies and discussion. Twenty-five seminars were held during March and April, for approximately 365 members.



Summary

The road to a quality based management system that is woven into the fabric of an organization is unending. There are hills, twists and turns, rivers and obstacles to cross, and unknown barriers to overcome. Having a strategic approach to transforming culture uses the vision and mission to set the direction. The key success factors and values of the organization frame the journey and set the boundaries. Processes geared to satisfying the customers' requirements is the basic step. Measurements based on the key quality characteristics (as defined by the customer) help us to manage the processes. Empowerment indicates an environment of trust which helps liberate the talent in the organization. The Action Plan includes the routes that must be covered. Team linkage provides a structure that ties the improvement ideas to the resources and leadership. The orientation seminar provides a common roadmap to all participants.

At DSMC we recognize the journey is long and arduous. However, given our desire to be the academy of distinction promoting systems management excellence, we must become focused on customers requirements and committed to providing a product or service that delights the customers. We believe the strategic approach we have adopted to manage the administrative processes along with our work on changing learning theories and methodologies will enable us to reach this vision.

Works Cited

Achieve International. Service/Quality Implementation System: Participant Workbook. 1993.

<u>Achieve International</u>. <u>Strategic Process Management: Executive Strategy Session Participant Workbook</u>. 1993.

Clemmer, Jim. Firing on All Cylinders, Homewood, IL: Business One Irwin 1992.

Langford, David. Total Quality Learning Seminar Workbook. Winter 1993.

Tribus, Myron. Quality First, Washington DC, Published by the National Institute for Engineering Management and Systems, 1992.

United States Air Force. The Quality Approach. Fall 1993.

Organizational Culture's Impact on Quality Air Force



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ORGANIZATIONAL CULTURE'S IMPACT ON QUALITY AIR FORCE

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Abstract

Since 1988 the Air Force, its Major Commands, and Units have had a less than universal approach to change. There have been a number of changes we have had to deal with. A large number of those we have little or no control over, however, there are some we do. These fall into the category of the way we operate on a day-to-day basis. This change can be addressed by the successful implementation of principles Quality Air Force (QAF).

When it comes to implementing the concepts of QAF many military organizations have "jumped on the bandwagon." Often they have done this without completely understanding the work, time, and commitment required to successfully implement QAF.

The failure of some efforts is not due to the lack of desire or understanding. It is in not addressing the organizational culture required that will contribute to QAF's success.

This paper will provide military organizations with information about the importance of organizational culture that supports the philosophy of Quality Air Force. Next it will introduce the following seven elements necessary building blocks for an organization to successfully implement QAF:

- 1. Information for Improvement: 2. Authority Equal to Responsibility: 3. Rewards for Results:
- 4. Cooperation, Not Competition: 5. Job Security: 6. A Climate of Fairness: 7. Employee Ownership:

The paper will then discuss how to shrink the existing gap between the military organization's current culture and the desired culture for supporting QAF.

Introduction

If you mention Quality Air Force (QAF), or the principles of participative management, you will hear a wide range of responses, both positive and negative. Basically, it is a fundamental management concept that is as old as time and universal enough to work in any organization that has people providing products or services to other people. There is no organization exempt. Private, public, profit, or non-profit, they all can benefit from the use of this concept.

Then, if "Quality Management" is as applicable as this, why are we having such a difficult time implementing it Air Force wide? When it comes to implementing the concepts of QAF many organizations have "jumped on the bandwagon." Often they have done this without understanding the work, time, and

commitment required to implement QAF. The failure (or perceived failure) of some of their efforts is not due to the lack of desire or understanding, but rather, not addressing the culture that can contribute to QAF's success.

This paper will provide military organizations with information about the importance of a culture that supports the philosophy of Quality Air Force.

Organizational Culture and its Elements Relating to QAF

The topic of organizational culture has become extremely important to American companies and military organizations as a major component in improving their productivity. Since QAF is fast becoming the method of choice to increase productivity, addressing its relationship to organizational culture is inescapable.

Despite the increased attention and research devoted to organizational culture, there is still some confusion about the term *culture* and how it relates to the successful implementation of QAF. Examination of the different definitions suggests that organizational culture is the pattern of basic assumptions, values, norms, and artifacts shared by organization members.

When implementing QAF, the hardest part to understand and apply is the most important part, that is, creating, nurturing, and sustaining a culture based on QAF. The assumptions, values, etc., that make up an organization's culture is almost exclusively defined and expressed through leadership and shared by the members of the organization.

Assumptions in a traditional organization's culture usually involve the concept of "if-then" statements. That is, "If I do this, then that will be the result." For example, a worker knows that quality control data goes to the supervisor and then on to the commander. The worker may believe that when it is time for performance appraisals (and rewards) there will not be a good OPR/EPR or medal if the numbers are "bad." The belief is, "If I give them accurate numbers, then they will use those numbers against me." Of course, such a belief will stifle efforts to apply QAF tools. The worker will only generate and report "good" numbers.

Like the culture of a society, an organization's culture is so deeply ingrained that it is taken for granted. One reason for beliefs that work against QAF can be found in the values they reflect. In the example given, the underlying value is people should be controlled by rewarding or punishing them for their performance. This is very different from the value of processes should be controlled to result in excellent performance, to produce goods and deliver services of the highest possible quality. The first value has little to do with organizational performance. The second value relates directly to effective adaptation and achievement of organizational goals and indirectly to the effective coordination of a series of work activities. The most important values and beliefs deal with three crucial areas of organizational functioning: adapting to change, achieving goals, and coordinating the work efforts of workers.

If QAF is to develop as an integral element of an organization's culture, a set of values and beliefs must also be an important part of that culture. Values and beliefs, remember, tell us what is right and what is wrong, as well as the way things happen ("if ... then ..."). The values and beliefs that define an organization's culture and direct people's actions must be based on QAF assumptions if they are to support QAF.

Culture is complex. The beliefs and values that make up an organization's culture support and reinforce one another. Often they are interrelated to the point of being interdependent. To understand the basis of a QAF culture, a complex web of QAF culture elements must be established and understood. However, to define these elements of culture, one may need to step back and isolate the assumptions, policies, and practices that shape it.

The following seven elements are considered to be crucial of a QAF culture:

- 1. Information for Improvement: Performance and quality information must go to those who use it to understand problems, develop solutions, and take action. Such information must not be used to judge individuals' performance.
- 2. Authority Equal to Responsibility: Workers responsible for doing the work and attaining certain outcomes must have the authority they need to carry out their responsibilities effectively.

3. Rewards for Results: There must rewards for results. Individuals, teams, and all members of the organization must share equitably the fruits of their efforts.

4. Cooperation, Not Competition: Cooperation must be the basis for working together. To the extent

possible, people in an organization must support one another's effort, not compete with one another.

5. Job Security: Workers must know that their jobs are secure, that they will not be discarded at management's convenience like an obsolete piece of equipment.

6. A Climate of Fairness: Everyone in the organization must perceive that a climate of fairness exists, based on the behaviors and actions of managers at all levels.

7. Employee Ownership: Workers should have an ownership stake in the organization.

The remainder of this paper will concentrate on how these elements affect organizational effectiveness, how they interact with change, and how to implement them into a culture supporting QAF into the 21st century.

Culture Elements and Organizational Effectiveness

The current interest in organizational culture derives largely from its presumed impact on organizational effectiveness. There is considerable speculation and increasing research suggesting that organizational culture can improve an organization's ability to implement new operational strategies (such as QAF) to achieve high levels of excellence.

Culture is an asset but can also be a liability. It is an asset because culture eases and economizes communications, facilitates organizational decision making and control, and may generate higher levels of cooperation and commitment in the organization. The result is efficiency, in that these activities are accomplished with lower expenditure of resources, such as time and money, than would otherwise be possible. The stronger the culture, the greater its efficiency.

To take a closer look at how culture influences organizational life lets examine the seven elements of a QAF culture in an operational setting.

1. Information for Improvement:

Earlier an example addressed a worker's belief about the possible consequences of providing higher-level managers with accurate performance and quality information. These beliefs and their effect illustrated a major obstacle to QAF. That is, most military organizations use information not to improve performance and quality, but in an attempt to control workers. They monitor and evaluate workers to make sure they "do it right" or, at least that they do what management wants them to. With this aim in mind, management uses rewards for good results and punishments for bad results.

This practice goes directly against Deming's key principle, "Drive out fear." Organizations that try to control workers' performance by reward and punishment make it certain that workers will not share accurate performance and quality information with management. After all, who would want to give higher-level management information that resulted in negative outcomes for the person providing the data?

Too often, quality information goes up the hierarchy to a person's boss or even higher and the data are tied to that person as a "cause." This signals that the purpose of the performance and quality measurement system is to control individual workers through rewards and sanctions. Such systems aim to control people, not to improve performance and quality. QAF has very little chance of succeeding under these conditions.

Organizations usually concentrate on the results. Unfortunately they look at these results in terms of blaming someone for bad results. This cannot lead to continuous improvement of the processes that provide those results.

Not only does the attempt to control people reinforce the wrong values and beliefs, it also results in a deadly by-product: fear. Deming refers to fear as the great enemy of quality improvement in any

¹ Marshall Sashkin & Kenneth J. Kiser, Putting Total Quality Management to Work, (San Francisco, CA: Berrett-Koehler, 1993, pp. 77-109.

organization. If one is afraid that poor performance or bad numbers will result in sanctions, a reprimand, or even loss of one's job-then, no one is likely to provide management with bad numbers. In such situations, workers quickly learn that the only important job is producing good numbers. Making high quality products or delivering high quality services becomes irrelevant. In this way high quality, in terms of excellent performance, and customer satisfaction (the essential elements of goal achievement) becomes almost irrelevant. Only looking good is important.

2. Authority Equal to Responsibility:

Those responsible for hands-on production or service activities must also have the authority to take positive actions based on performance and quality information. This means making process control-production and service assessment and improvement a basic part of workers' jobs. People must have the authority to control and improve the work for which they are responsible.

This cultural element states that workers should control their own work activities rather than following orders from above or performing a set of mindless, rote actions. In the language of modern human resource management, the term most often heard is "empowerment." A worker should not have to obtain approval from above for every minor change that might be made in some set of standard procedures.

Enabling workers means providing them with training in QAF concepts and applications as well as in the use of statistical tools for quality control and improvement. There are other, less obvious, training needs if workers are to be effectively enabled as well as empowered. For example, new teams created to apply QAF methods, either on an ad hoc task force basis or as permanent work groups, often need to learn how to work effectively as a group. Workers who are enabled and empowered have knowledge, skills, and opportunity to take corrective actions to solve problems and make improvements.

Empowering workers and creating self-managing teams can be a frightening prospect for some managers. Many fear that they will lose their jobs when teams no longer have formal supervisors. While this has happened in some cases, the reason is not usually elimination of the job. More often, managers lose their jobs when self-managing teams are developed because they cannot perform the new roles of facilitator and coach. Other managers are concerned more with losing control than with losing their jobs. What they fail to realize is that control based on formal authority is really very weak. Effective leaders know one acquires far more control by empowering others and, in a sense, giving away one's formal authority. When self-managing teams are used effectively they actually increase the total amount of control and influence in an organization and lead to increased effectiveness.

3. Rewards for Results:

QAF requires that achievement be recognized, both symbolically and in terms of material rewards. All too often rewards are merely symbolic-a certificate, a pin, or the worker's name on a plaque or in a newsletter story. This sort of symbolic recognition is important, and it is not being suggested that they be eliminated. However, symbolic rewards should be accompanied by material rewards such as cash bonuses or special privileges that workers see as important. It is also important for concrete rewards to be joined with symbolic rewards. Such linkage reinforces the values being rewarded in an open and obvious manner, making those values stronger and more widespread among the organization's members.

Material rewards support and reinforce the value that it is good to achieve high quality and productivity or that problem solving (effective adaptation) is good. If such achievements are good, one would wonder why management fails to reward them. If problem solving is important, one must ask why management's recognition of effective examples is limited to symbolic rewards. Eventually, one realizes that such achievements in quality, productivity, or problem solving are *not* in fact valued.

Some would argue that a true QAF system need not include a purely individual reward element. There is some disagreement. Even in Japan, recognition rewards occur both on the individual and group level.

Kathleen D. Ryan and Daniel K. Oestreich, *Driving Fear Out of the Workplace*, (San Francisco: Jossey-Bass, 1991).

Arnold S. Tannenbaum (Ed.), Control in Organizations, (New York: McGraw-Hill, 1968).

Suggestion systems are among the most common mechanisms used to reward workers. The average American firm with some sort of suggestion system receives about one suggestion for every seven worker, per year. In contrast, in Japan Mitsubishi get about 100 ideas per worker per year, Canon gets 70, and Pioneer Electronics gets 60. It is not, then, uncommon for a Japanese firm to get six to ten thousand times as many suggestions per worker per year as do American organizations.

Most military organizations take the easy way out when designing reward systems: They use mostly or solely individual rewards. This makes most of them susceptible to Deming's deadly disease of individual merit rating and annual performance appraisal. This type of reward system has a negative effect. It emphasizes individual competition. Thus, when one person receives a very positive rating, it often means that others must receive a low rating to maintain a normal distribution.

There are two important aspects to this culture element. First, workers must share in the outcomes of their efforts. This means that there should be material as well as symbolic rewards for the results that workers have helped to achieve. Second, rewards should be designed at all levels, that is, for individuals, for groups or teams, and for everyone (based on organizational performance and outcomes). It is difficult to design a multilevel reward system in which there is no conflict among individual, team, and organization-level rewards, but it is far from impossible. Rewards, both symbolic and material, are limited only by people's imagination, creativity, and of course the organizational culture. The key is consistency among individual, group, and organizational rewards. Achieving such consistency is often a challenge.

4. Cooperation, Not Competition:

As discussed earlier, all too often military organizations reward workers for individual efforts but not for actions that contribute to team or organizational performance. Even worse, rewards often accrue to a person when that individual's actions are detrimental to the performance of the group or the organization. Deming points out that in Japanese organizations everyone acts as part of a team, for the good of the entire organization. In military organizations it is often a matter of every person for him- or herself.

While efforts to strengthen the value of cooperation is important, this does not mean that it is necessary to eliminate competition completely. In any case, that would be impossible. It is foolish to attempt such a radical change in the basic cultural assumptions that are common to the Air Force society and reflected in our organizations. Two specific important examples are (1) the belief that individual should be rewarded (equitably) for their achievements and (2) the value of competition.

It is neither realistic nor reasonable to expect Air Force organizations in general to abandon competition. It is, however, both realistic and true that organizations are coming to recognize the advantages of collaborating and cooperation, internally and externally.

5. Job Security:

Security goes beyond guaranteeing efficiency. In many organizations the common adage is, "Screw up the first time and I'll get you. Screw up the second time and you're history!" Instead, what is needed is the commitment of managers at all levels to do everything possible and reasonable to coach workers to success. Too many organizations treat workers like inventory that can be replaced at will. However, only when workers feel a sense of job security will they take risks to make improvements. At a time when the Air Force is downsizing by eliminating jobs, workers' fear of making mistakes that might cost them their jobs can greatly reduce their potential effectiveness.

U.S. management has often viewed performance and productivity improvement as a matter of driving down cost. This, too, has negative effects on job security. Labor force reductions, which require the same or more work to be done by fewer workers, are an obvious way to reduce costs. The belief that it will at times be necessary to eliminate jobs to reduce costs may be why so few feel any organization can provide secure jobs. Nevertheless, these assumptions about reducing costs are false. Research and practice show that the best way to improve performance and reduce costs is to focus on quality improvement, with an emphasis on

what customers desire. Peter Drucker has observed that work must be done right or not done. Trying to get something done cheaply by using inferior materials and hoping that it will be all right is foolish.

Asserting that increasing quality increasing costs is "an argument from ignorance," according to Deming. That is because only costs that can be accounted for are considered. Other, unknown costs decrease with an increase in quality, for example, the cost of losing a customer due to poor quality. Such cost decreases may be far more important and substantial than any increases. One consulting firm reports that more than 80% of the customer losses are due to poor quality of the products or service. This firm points out, it costs five times as much to get a new customer as it does to retain an exiting one.

It is shortsighted to seek to cut costs by cutting corners. It is even more self-defeating to try to reduce cost by laying off workers. Doing so shows that the organization does not value people. It is difficult to imagine why workers who see their coworker laid off to reduce cost would want to help the organization make a better product or deliver a better service.

6. A Climate of Fairness:

Recent research shows that by their actions, managers create organizational "climates." These climates can be characterized as fair or unfair, as seen by workers. However, fairness is a much more complex issue than many people assume. Some of the most respected philosophers, from ancient times to the present have struggled to define the nature of fairness. Part of the problem is that fairness is in the eye of the beholder. Two people can look at the same situation and one can judge it as grossly unfair while the other finds nothing amiss. The solution is simple in one way and complicated in another.

The simple part is that fairness depends mostly on manager's actual behaviors, especially the behaviors of top-level leaders. Managers can choose to act in ways that create a positive climate of fairness. The complex part is that acting is far more difficult than deciding, because it involves interrelated behaviors that require skill and practice. According to Sashkin & Kiser there are seven specific aspects that must exist to show an organization has a climate of fairness: (1) trust; (2) consistently; (3) truthfulness; (4) integrity; (5) equality, (6) respect and (7) due process.

Many of these aspects of fairness relate to one of the other factors that support a QAF culture. Fairness is important for QAF. It is difficult if not impossible for workers to feel empowered, to believe that there will be rewards for results, or to act cooperatively unless they perceive conditions as fair.

7. Employee Ownership:

In a recent best seller, Harvey Mackay, CEO Mackay Envelopes, says, "Owning 1 percent of something is worth more than managing 100 percent of anything." Research bears out Mackay's assertion. Worker-owned firms are, on average, half again as profitable as comparable firms without some form of worker ownership. In many American organizations, management has discovered that workers' capitalistic economic stake in the firm seems to strengthen the other cultural factors discussed. Total worker involvement becomes even more effective when workers have a stake in the firm as well as a say in work-related matters.

While ownership can be a significant factor, it is not necessarily the most important factor. Of course, in some organizations, such as government agencies, publicly owned agencies, or cooperatives, worker ownership is not possible. The key is that workers must feel and act as though they are the owners. Sometimes creative ways can be found to give workers a legal ownership stake. For example, the Canadian

These and other issues centered on the fallacy of cost reduction as a strategy for increasing profit are considered by Rafael Aguayo in the first two chapters of Kohn's book *No Contest: The Case Against Competition* (Boston: Houghton Mifflin, 1988).

From the brochure of Greenfield Associates, a licensee of the consulting firm Wilson Learning Corporation.

Marshall Sashkin & Kenneth J. Kiser, Putting Total Quality Management to Work, (San Francisco, CA: Berrett-Koehler, 1993, p. 104.

Harvey Mackay, Swim with the Sharks Without being Eaten Alive, (New York: William Morrow, 1988, p. 191).

Michael Conte and Arnold S. Tannenbaum, *Employee Ownership*, (Ann Arbor: Survey Research Center, Institute for Social Research, University of Michigan, 1980).

post office has publicly considered issuing stock that workers could own. Even when legal ownership of the organization is impossible, workers can have a sense of ownership over their work and actions. This only happens when it is fostered by the culture created by top managers.

Aligning an Organization's Culture to QAF

Many managers see the signs indicating the need for a quality culture change in their organizations. They realize that basic changes in the organization's thinking and behavior regarding quality are needed. Research has identified the conditions under which a major overhaul of the quality culture is necessary:

- The organization has a current quality culture that is out of sync with the changing environment.
- The organization's quality performance is judged to be mediocre or worse.
- Major changes in the organization's mission require the quality culture to change.

One method of culture change is called culture gap analysis, and it can be easily adapted to the development of a desired quality culture in an organization.

To begin, an organization's managers must review its quality mission and goals. They must identify the quality attributes needed to compete and remain efficient. For example, in the deregulated banking environment, banks are forced to adopt a more customer-oriented approach to product development, delivery, and marketing. The desired quality attributes are newer products with attractive features and aggressive customer delivery and contact.

The next task for managers is to identify the important and desired quality values that the organization should have. The quality values will vary, depending on the organization's key quality attributes. Many quality experts, however, believe that some quality values are basic and are needed inversely if an organization is to improve quality.

Once the desired quality values are identified, the managers can identify the target groups (organizational subunits or the whole organization) that should have the desired values. They must also determine whether substantial discrepancies (culture gaps) exit between current values and the desired values. After completing this task, the managers can correct the culture gaps through appropriate interventions. They should repeat these steps as the environment of the organization changes.

The leadership role of top management is essential in forming an organization's quality culture. Quality literature has described top management's role in a number of different areas, including leadership and reward systems.

In In search of Excellence, Tom Peters and Robert Waterman stress the importance of the founder or top manager in forming the culture.

In many organizations, top leaders are important role models, and they are the source of norms that will be followed by the rest of the organization.

Top managers must convey the importance of quality by:

- Spending a significant proportion of their time on quality issues
- Continually communicating the quality goals, both verbally and on paper

⁹ John Urquhart, "Canada May Let Mail Workers Buy Shares in Agency," Wall Street Journal, May 1, 1992.

¹⁰ Bro Uttal, "The Corporate Culture Vultures," FORTUNE, Oct. 17, 1983, pp. 66-72, and Vijay Sathe, Culture and Related Corporate Realities, (Homewood, IL: R.D.\ Irwin, 1985), p.363.

The quality culture change method proposed here is developed from insights from Ralph H. Kilmann, Beyond the Quick Fix, Managing Five Tracks to Organizational Success (San Francisco, CA: Jossey-Bass, 1985), and Edgar Schein, Organizational Culture and Leadership.

Deming, "Improvement of Quality and Productivity Through Action by Management", Juran, "Product Quality-A Prescription for the West, Part I and II", and Crosby, "Quality Is Free."

Tom Peters and Robert H. Waterman, In Search of Excellence, (New York, NY: Harper & Row, 1982).

- Making the quality department's function and role visible
- Emphasizing quality issues and incidents throughout the organization
- Providing funds for equipment and training and development opportunities
- · Devising reward systems that recognize workers and managers for their quality achievements

To be trustworthy, managers' words must be consistent with their actions. As a group, managers must also establish credibility by having some expertise in quality. Finally, top managers need to have a vision of how to build a quality culture. This vision must be operationalized through the quality mission and goals.

Literature suggests that much of the work in the future factories will be performed by teams of workers rather than by individuals.

Consequently, systems for monitoring and rewarding individual performance are less likely to be useful compared to systems that monitor and reward group's performance. Promoting strong quality performers, adjusting their compensation, and recognizing them (non monetary rewards) can also send strong signals to the organization on the importance of quality.

Earlier seven elements of a quality culture were identified that must be present to support QAF. It is difficult to explain how to use these and other tools to construct cultural elements, to make changes and make them stick.

In operation QAF depends on the efforts of those who do the core work of the organization, although Deming is correct when he says that everyone must take action to accomplish the transformation. Still, it is leadership that set these processes in motion. Leaders bring people together under a shared vision. They create the conditions under which that vision can be made real. They do this by constructing an organizational culture based on the value and beliefs that define and support QAF.

Conclusion

Only Leadership can Make it Happen

Of all the information on organizational culture, the most important ones were those which talked about the role of leadership. Lip service from top management will not create a culture that supports QAF. Nothing senior leaders can do will implement QAF, if the people doing the work of the organization are not deeply and directly involved in applying QAF in the context of their normal work activities. However, leadership is responsible for creating and fostering the atmosphere, guidelines and yes, culture, that workers must operate in. They must understand the difference between the values and beliefs that support QAF and those that do not.

Top-level leadership is crucial in setting the tone culturally for QAF to be successful. However, the role, support, and action of lower-level workers is equally important. It is, then, something of a paradox, yet absolutely true, that the way QAF really works is top-down from the bottom up. As Deming says, it is the role of management to define and design the system and to do so in a way that builds in quality. In a traditional organization, workers are responsible only for operating the system, but they often do not have the authority they need to do so effectively. QAF organizations are designed so that workers have the authority needed to carry out their responsibilities effectively.

When addressing organizational culture, the things leaders place emphasis on is the same thing the rest of the organization will place emphasis on. So, modeling values and beliefs through leadership behavior is essential to the direction of the organization's culture. With this in mind, leaders should engage in personal actions that illustrate and reinforce QAF values. This modeling is just as important as defining values and making sure they are reflected in organizational actions. Through these personal actions leaders demonstrate a constancy of purpose. They show their commitment to achieving the organizational vision of total quality management.

¹⁴ Richard J. Schonberger, Building a Chain of Customers, (New York, NY: Free Press, 1990).

Jayant V. Saraph and Richard J. Sebastian, "Developing a Quality Culture", Quality Progress, Vol. 26 September 1993, p. 77.

Following the Cultural Elements of QAF is Essential

The seven specific elements common to QAF cultures were covered earlier. There are surely others, however, these are the most important. Attempting to describe and discuss all elements would be beyond the scope of this paper.

The seven culture elements are founded on certain values, the sense of what is right and what is wrong. They are based on specific beliefs about the way things work-and the way they should work-in organizations. They do so by exhibiting, reflecting, and in concrete ways supporting the values and beliefs that underlie OAF.

Some of the seven elements are relatively simple to implement, at least in concept. Implementing other culture elements can be more complex and challenging. An example would be developing policies, systems, and practices that reward workers for results and for team and organizational as well as individual performance. It can be even more difficult to make some of the elements described a part of the organization's culture. Three obvious examples are developing a climate of fairness, instilling cooperation, and empowering workers.

In every case, however, the key is action. Leaders and managers construct and reinforce the organization's culture by their actions. It is important to remember that these elements do not work in isolation of each other nor is there any particular order in which they must be implemented.

Quality Goals Must be Communicated (verbally and on paper)

People will believe that they are integral parts of an organization only if they feel that communication goes in all directions-up, down, and across all levels of the organization. Poor communication is one of the greatest barriers to continuous improvement. People know that communication is a two-way process-they want to see that managers are listening to what people have to say as well as relaying information.

Information, like knowledge, is power. Many people mistakenly believe that sharing information somehow diminishes their position. In fact, sharing is the only way that people can ensure that they are building a relationship based on trust.

Among the type of information that must be communicated, the goals of the organization must be the most important. These should describe the direction in which the organization is heading. An Organizational Strategic Plan, built by as much as the organization as possible, will provide an excellent tool to communicate quality goals though out the organization. This document addresses specific objectives the organization wishes to meet in the short and long-term. Workers can actually see where the organization is going and the part they play in its success.

Resources Must be Provided

In 1979 Philip B. Crosby authored a book titled *Quality is Free*. Unfortunately many business leaders took the title figuratively. Somehow they got the impression that you can improve quality at no additional cost. This way of thinking will get you in trouble. When considering the proper use of resources to implement QAF, senior leadership should understand the concept of ROI (return on investment). When Mr. Crosby referred to "free" he was showing that improved quality can lower overall cost, dispelling the popular belief that high quality means higher total cost for the organization. Eventually the cost of implementing QAF is overcome from the benefits, in other words "free."

If innovation, growth, and revitalization are mandatory in a world characterized by rapid change and world-wide competition, organizations must find a way to breathe new life into their procedures, management styles, and cultures. Otherwise, military organizations will continue to lose ground to the private sector.

Managing organizational cultures is now possible. If organizations continue to improve their understanding of this important concept, they will be able to develop new methods that increase their control of organizational cultures, instead of vice versa. They should refrain from latching onto the next panacea because it is called by a new name. If the current interest in organizational culture is taken seriously and lasts, Americans will not be reading about the demise of entrapreneuring, organizational mergers, or any other efforts toward innovation and revitalization. Rather, what will be seen, will be an integrated approach to managing organizations is possible with people-and culture-at center stage.

BIBLIOGRAPHY

Brannen, Mary Yoko, "Culture as a Critical Factor in Implementing Innovation," Business Horizons, Nov./Dec., 1991, v34, n6, pp. 59-67.

Carr, David K. & Littman, Ian D., Excellence in Government: Total Quality Management in the 1990s, Arlington, VA, Coopers & Lybrand, 1991.

Crosby, Philip B., Quality is Free, New York, NY, McGraw-Hill, 1979.

Cummings, Thomas G. and Worley, Christopher G., Organization Development and Change, St. Paul, MN., West Publishing Company, 1993.

Deal, Terrence E. and Kennedy, Allen A., Corporate Cultures: The Rites and Rituals of Corporate Life, London, Addison-Wesley, 1982.

Deming, W. Edwards, Improvement of Quality and Productivity Through Action by Management, Massachusetts Institute of Technology, Cambridge, MA., 1982

De Pree, Max, Leadership Is an Art, New York, Doubleday, 1989.

Juran, Joseph M., Juran on Planning for Quality, New York, NY, The Free Press, 1988.

Kilmann, Ralph H., Beyond the Quick Fix, Managing Five Tracks to Organizational Success, San Francisco, CA: Jossey-Bass, 1985.

Mackay, Harvey, Swim with the Sharks Without being Eaten Alive, New York, William Morrow, 1988.

Mayer, Jeffrey J., If You Don't Have the Time to Do It Right the First Time, When Will You Find the Time to Do It Over?, New York: Simon & Schuster, 1990.

Peters, Thomas J. and Waterman, Robert H. Jr., In Search of Excellence: Lessons from America's Best-Run Companies, New York, Harper & Row, 1982.

Reich, Robert B., The Work of Nations, New York: Knopf, 1991.

Ryan, Kathleen D. and Oestreich, Daniel K., Driving Fear Out of the Workplace, San Francisco, Jossey-Bass, 1991.

Saraph, Jayant V., and Sebastian, Richard J., "Developing a Quality Culture," *Quality Progress*, Vol. 26 September 1993, pp. 73-78.

Sashkin, Marshall & Kiser, Kenneth J., Putting Total Quality Management to Work, San Francisco, Berrett-Koehler, 1993.

Planning and Management in Tomorrow's Organizations – The Need for "PDA"



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Planning and Management in Tomorrow's Organizations The Need for "PDA"

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Abstract

Many organizations have not developed strategic plans for the implementation of quality. Further, for those that have, many lack appropriate detail to sufficiently achieve established goals. Strategic plans are also often separated from other functional plans. This separation causes suboptimization and further contributes to the difficulties faced in attaining established objectives. Another significant barrier is the lack of total organizational involvement in the planning process. Plans are developed at the staff level, far removed from the first line workers resulting in an increased opposition between line and staff functions. To be successful, an organization must deal with these inadequacies. It must establish a consolidated strategic plan that represents all aspects of the organization. It must develop methods of increasing involvement in the planning process and establishes specific strategies for execution of the plan. Assessments must be conducted to monitor progress and provide input for fact based changes to the organizations plans.

We have found such a plan. Developed from civilian and military organizations, the PDA process (Planning, Deployment, and Assessment) alleviates the deficient areas of traditional planning systems. In PDA, all plans are consolidated into one workable and manageable document. Involvement from the entire organization is used to develop the plan. Once developed, specific and standardized strategies are used to ensure actions are taken to achieve objectives established. Finally. PDA allows for ongoing measurement of progress toward plan accomplishment through a simple, yet effective system of metric reviews and self-assessments. The PDA process is revolutionary in terms of simplifying planning processes and producing effective and lasting improvements.

Planning and Management in Tomorrow's Organizations The Need for "PDA"

Management philosophies have been altered significantly since the days of Frederick Taylor. We have had the revolutionary thinkers of Armond Feignbaum, W. Edwards Deming, and Joseph Juran. We have seen the passion in Tom Peters and Phil Crosby. We have laughed along with John Guaspari and Joel Barker as they pointed out the obvious - organization must change if they intend to survive. These quality advocates have taught us that management theory and leadership practices are not stagnant; least they should not be. Even with the changes we have seen in management and leadership, one constant has remained; the need for an overarching plan to achieve the aims of the organization. This critical component is known to all but possibly underestimated. What holds true is that successful people and organizations share a common golden thread - strong efforts in strategic planning and assessment. Unfortunately, the planning and assessment in many of today's potentially successful organizations suffers from four main afflictions: separation in plans (i.e. quality plans, human resource and development plans, business plans, etc.), a lack of total organizational involvement in the planning process, a general lack of execution for any plans that are developed, and a lack of appropriate assessment methodologies. comprehensive process must be established that links all of these components. We have found, and are implementing such a process and initial feedback is quite promising.

The process we have developed is a combination of several plans and methodologies from both the military and the civilian communities. It is a blend of Hoshin planning, Juran Institute Planning Models, the Air Force Quality Institute's Strategic Planning Model, and practices in use by Storage Technologies Corporation of Louisville, Colorado. We call it the Planning Deployment and Assessment process (PDA). In the PDA process, all plans are ingrained in into one central and overarching description of the desired state for the organization's future and people at all levels of the organization are involved in creation of the plan. Each component of the plan, every aspect, is carried out through a simple yet systematic method of execution. Finally, assessments are continuous - an ongoing process which provides constant feedback to the entire organization allowing "fact based" adjustments to the organizations processes as well as to its strategic plan.

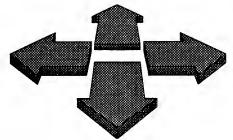
This paper will provide you with a clear understanding of the need for a process such as PDA. It will show you, in detail, how each component of the plan is developed, deployed, executed, and assessed. Finally, this paper will show you how to begin such a process in your organization. For our organization, this process has already proven its worth. We are confident that this "PDA" process will take us into the year 2000 as winners - we hope that it will take you there as well.

PDA Fundamentals - Acknowledge the Crisis & Know the Response

Crisis #1 - Separation of Plans

Ten years ago, a company starting a Total Quality Management Program was atypical, Today, you're not mainstream if you're not holding quality councils, process action teams, conducting quality training, and passing out yet another customer satisfaction survey. Unfortunately, much of the work towards implementing quality is in vain

because our efforts are scattered and without a central focus. This lack of focus stems from either the lack of a strategic plan, or having a strategic plan for quality implementation that is a written as a separate document from the organization's business plan. This causes separation between "Quality" and daily operations. When we do build plans, we usually make them too complex to be used



functionally - as tools to help improve our performance and guide our efforts. Often, these plans spawn even further specialized plans such as the human resource development and management plan, financial plans, facilities plans; etc. The list goes on. Having these plans separate from one another not only confuses issues with too many plans, but plan mangers are needed for each one. What's worse than too many plans is when one plan suboptimizes another plan. This is a natural and expected result when plans are developed separately from one another. Trying to blend these plans together is no easy task considering the number of authors, styles, and directions involved. It is truly amazing that organizations suffering from this planning disease ever get anything done. In many respects, their plans themselves are inhibiting the organization's efforts.

Response #1 - Integrate the Plans

We began our quality journey in the fall of 1990 and although we had a lot of activity related to the quality movement, we had no focus; no plan. We knew that a plan would be helpful but we didn't know exactly how to start the planning process. Our major concern was that we would create a plan that was either a mirror of our current status or an unrealistic projection of our organization's future state. All we really knew was that we needed more training. The Juran Institute was holding a strategic planning course as a precursor to its IMPRO '92 conference and it seemed like a logical place to start. After hearing the keynote address from A. Donald Stratton of Storage Technology Incorporated, our understanding of the need for and value of a comprehensive strategic plan was solidified. After the conference, we contacted Mr. Stratton and queried him on the planning efforts at StorageTek. Building on the

information gained from the Juran Institute's planning course, and the data collected from StorageTek, we set out to create our first true strategic quality/business plan.

In order to be effective, the plan must contain elements from each area of concern for the organization. In our case, our primary concerns were that of our parent unit, the Air Mobility Command (AMC). While AMC had not officially published a planning document, they had published key processes or areas of concern. Additionally, AMC had decided to adopt the assessment criteria of the Malcolm Baldrige National Quality Award. When we combined the two, we found that our plan would be best constructed following the assessment criteria that would be used to gauge our progress. Additionally, the meat of the plan (goals and objectives) should be aligned with the key areas of concern for our parent organization - as they applied to us. What we wound up with was a strategic plan with specific emphasis on each of the seven areas of the Malcolm Baldrige Award criteria. (This criteria was later adapted into the Quality Air Force criteria.) As we made this transition, we found that all of the separate plans our organization had, could be brought together into one comprehensive document. Human resource and development plans were easily tailored into our overall plan. Financial considerations were woven into each area as needed. Other plans like the facilities upgrade plans, improvements in communications, and training plans also blended into either one of the seven categories or one of our seven goal areas. By blending all of the plans into one comprehensive document, we were able to ensure that all functional managers, regardless of their official position, were focused in the same direction.

Crisis #2 - Lack of Total Involvement in Planning Process

Another barrier to creating a solid strategic plan is the level of involvement traditionally used to develop organizational plans. Most companies claim to have their strategic plans developed by their senior leaders. What that generally means is that an executive assistant or an aid will be locked into an office until he/she is able to produce a draft for the senior leaders. These drafts are then quickly reviewed and approved to fulfill the need for a plan. Even if the senior leaders had developed the plan themselves, significant problems persist. For example, the fact that senior leaders alone created the plan often reduces "buy-in" from other members of the organization. When the senior leaders are the only ones involved in building the plan, they must then "sell" that plan to the workforce to build commitment. Even then, some commitment will only be token. Other managers believe that the rest of the workforce, especially the lower levels, "don't get paid to like it - just do it!" This may be true to a degree, but try to force a plan on anyone and they will put in the required time - but no the effort. The commitment just isn't there. Another problem is that when senior leaders alone build the plan, they may make the plan requirements too high - or too low. Often, the barriers seen daily by to workers and mid-level managers are invisible to a senior leader. Senior leaders are not expected to know the daily workings of a

particular functional level process - nor should they. Whey they begin to try, a resounding scream of "micro-management" rings clear, and rightfully so.

Response #2 - Total Organizational Involvement in Strategic Planning

Our strategic plan of 1993 was the first attempt we were to make at serious strategic planning on a comprehensive scale. One of the most important lessons we learned was that total organizational involvement in the entire planning process is a must. Our 1993 plan was developed by quality advisors. It was then submitted to our executive board for approval. In all, three changes were made to the original product and two of those were grammatical changes. At first, we thought we had succeeded in building the perfect plan since we had so few objections. What we really had was a lack of buy-in and commitment to the total package. This is not to say that our senior leaders were not in support of the plan. They simply did not have pure ownership - it was not "their" plan. We found this to be a significant barrier as the year progressed and few of the aims of the plan were being achieved. In fact, the only areas we were having successes in were the functionally related goals for our key processes. The primary difference between these and the overall plan itself was that the key processes were owned by the functional managers. Success in a key process equaled a functional area success. We simply did not have the same level of emotional attachment to the strategic plan as a whole.

As we refined our planning process, we expanded the level of involvement in plan development. We took personnel who had conducted a self-assessment in the past and made them "area champions" - one for each area of the QAF criteria. These people, mostly mid-manager level, were our experts in assessment criteria. We then paired these area champions with members of the executive quality council as well as members of subordinate quality councils in each of our functional areas. Once the paring was done, we had seven teams of five to six members each. These teams each took a category of the assessment criteria and developed a description of desired actions for the upcoming year and beyond. They used the results of our most recent self-assessment, as well as the validation of that assessment provided to us by our parent organization, AMC. Over a two week period, the requirements for the seven areas were developed. Then, the senior executive board reviewed our previous year's goals. Once approved, a "catchball" approach was initiated with the subordinate quality council; refinements and adjustments made at each level until agreement was achieved. Finally, the goals were approved for the organization as a whole.

The next step in the process was to build supporting objectives. For this task, the senior council withdrew, allowing the subordinate council to develop "ownership." Here again, a catchball approach ensured all affected personnel had the opportunity to provide input for the final product. This process is carried out through the entire planning process as well as through the execution phase of the plan. While this method does take more time than tasking someone to build a strawman, the end result is a plan

that is owned by a substantial portion of the organization. The time spent in building the plan is easily made up in not having to sell the populous on its worth. Additionally, the aims developed are more realistic since they do not represent one portion of the organization's view on the desired future state. When completed, a set of milestones for each of the seven QAF criteria areas and a set of goals with corresponding objective for each of the key processes is developed. All that remains is a plan for achieving these milestones, goals, and objectives.

Crisis #3 - Lack of Execution

Despite the difficulties involved in plan development, some organizations have succeeded in developing viable plans and have gained "buy-in" from the workforce. However, even those successfully written plans are doomed to fail if a method of execution for the aims of the plan is not laid out. A major complaint in many organizations is that everyone is busy but no one knows what's going on. People seem to spend their time reacting to one crisis after another. Activities don't seem to have a direct correlation to the goals and objectives established in the organization's strategic plan. In other words, we plan the plan and work the work. (This is in direct opposition to the prime directive of strategic planning; plan the work, work the plan.) This is generally true because once the goals are established, and supporting objectives are developed, the planning process stops. No formal means for achieving the objectives is developed. In many cases, the hope is that having an objective established will draw attention to it and people will work harder. This desire closely mirrors the results of the Hawthorn studies. So long as the organizations members know they are being measured, output will increase. Unfortunately, as was learned from the Hawthorn studies, once people become accustomed to the measurement, output will return to the previous level or even drop off further. Another difficulty with achieving the results desired in the strategic plan is that if the objective has been attempted in the past, and no new evidence (or plan) exists to show how that objective can now be reached, people will not be anxious to attempt to attain the target. Without a detailed and specific plan of execution, no goals or objectives will be reached.

Response #3 - Systematic Execution of Strategic Plans

Involving more people from all levels of the organization not only solves the problem of establishing commitment and buy-in, it also solves the problem of executing the plan. In most organizations, the planning process stops at the strategic level. In fact, in many cases, the strategic plans either don't match the tactical plans, or no tactical plans exist. When we began our quality journey, we had a goal for generating aircraft. In support of that goal, we established an objective of reducing the number of delayed departures. Unfortunately, as is the case in many organizations, the planning process stopped there. We had no idea how-to-reduce-the-number of-departure delays. Over the next year, our departure delays did not decrease and frankly, we were not

surprised. In order to be successful, a plan must be <u>executed</u>. We have adopted the concept of "means" to help us with both planning development and execution.

Once a goal and objective are established, they are taken back to the front line workforce. Remember, the front line had a significant part in developing the objectives so they should not be foreign to them. Now, simply ask them how to achieve the objectives. It is important that all parties involved understand that what we are looking for in means are very specific actions that can be accomplished in the next six to twelve months. An example will serve to illustrate this point best.

Suppose you have developed a goal to reduce the number of delayed departures from your station. As your investigation unfolded as to the causes of delays, you find that a large portion can be attributed to the aircrew arriving late. More analysis reveals that the majority of crews who arrive late are coming from off-base hotels. Crew rest requirements preclude you from alerting the crew earlier than you already do and your parent unit will not allow you to reschedule the missions. It would seem as though this is out of your control. But you continue to talk with your people - hear their frustrations. You find that if you could billet all the crews on-base you will nearly eliminate the problem. You continue to ask questions and find that the crew members would also prefer to stay on-base, transportation personnel certainly agree, and your budget analyst tell you that the cost comparison for one C5 crew off-base vs. On-base is nearly 20:1.

This is the point that many organizations stop the planning process. It takes a lot of work to get to this point and still have valid, quantifiable objectives. But the question remains, "How will I do it?" How will we bridge the gap between our current situation, and the objective state. The answer is in the "means." Ask the front line, the people engaged in the process to tell you the how. Conduct a brainstorming session but be careful. You have to get specific tasks. With some practice, a list as follows may result from your means gathering session.

- Find out if billeting will space block more rooms for our transient crews.
- Determine how many rooms we would need to guarantee on-base accommodations.
- Develop a formal cost-benefit analysis comparing on to off-base billeting.
- Draft formal proposal to increase number of rooms dedicated to transient aircrews.

Now all that remains is to schedule the activities into a formal action plan. When complete, you have a strategic plan that has involved a significant number or your people, is achievable, and is agreeable.

Goal: Reduce Delayed Departures 15% by Jan 96 Objective: Billet Aircrews On-Base, 100% of the Time

		AUG	SEP	OCT	NOV	DEC
•	Determine Number of Rooms Needed to Guarantee On-Base Billeting					
•	Develop Formal Cost-Benefit Analysis Comparing On to Off- Base Billeting					
•	Determine if Billeting will Space Block More Rooms for Aircrews					
•	Draft Formal Proposal to Increase Space Blocked Rooms to Desired Level					

Crisis #4 - Lack of Progress Assessment

People need to know how effective their efforts are. Senior leaders need to know how their organization is progressing to better adjust manning, funding, and other controls that are generally out of the workforce's control. Establishment of the Malcolm Baldrige Quality Award has gone a long way to assist us with our assessment efforts. The Air Force has adopted the Baldrige criteria and formalized their own Quality Air Force criteria. The prime impetus of this criteria is not to win the award - the winning is in the journey. When we use the criteria as a means of assessment of capabilities and progress, we are identifying both strengths and areas for improvement that can be focused on for future increases. Unfortunately, most organizations are assessing on a two year cycle. This means that changes to the plans, goals, objectives, and measures an organization uses may only come about every two years. A strategic plan should be a living document, constantly changing to meet the needs of the environment for which it was created. For this reason, a constant means of assessment must be created. Many organizations have developed extensive sets of metrics to track progress. This method is certainly valuable but only when the metrics are directly paired to the strategic plan. Sadly, this is not the case in all organizations. In fact, some strategic plans make little reference to organizational goals and objectives much less the metrics which should track and guide their progress.

Response #4 - Continuous Assessment of Progress

Once plans are in place, and the execution of those plans has begun, assessment of progress must occur. It is not enough to conduct self-assessments every two years to properly gauge progress. Strategic plans, and their respective tactical plans, must be changed to best fit their environment. The organization's strategic plan should be a living document that constantly adapts to the environment for which it was created. To properly assess progress in pursuit of strategic plans, the organization must have a monitoring system in place that allows functional area managers to anticipate the needs of its internal and external customers. To achieve this constant assessment requirement, metrics should be developed for each of the organizations objectives. Unlike some objectives in place in many organizations, we support the notion that an objective should be very specific. Objectives should be specific to the point that only one measure exists that indicates progress toward that objective. Doing so achieves several purposes:

- First, it forces the organization to develop "objective" objectives in that they have a quantifiable measure established.
- Second, it limits the number of objectives since each must be measurable. We have seen objectives that are only measurable through subjective means. While this is not all bad, the organization must assume that there is correlation between the objective and its measure. If that correlation is

incorrect, the metric is not truly showing progress toward objective accomplishment. For example, we have had an objective in the past to improve morale. An assumed indicator of high morale was the number of in-place consecutive overseas tour requests. The correlation seems appropriate until one considers the reasons a person may wish to remain in-place (high cost of living allowance, travel opportunities, etc.). In fact, the opportunities available may be sufficient to outweigh the low morale of the station.

• Finally, the metrics will seem more purposeful if they are directly tied to an objective the workforce had the opportunity to build. This makes validity of data and data purity more easily attained.

The second aspect of assessment is the link between the deployment of the strategic plan and the assessment tool used to measure progress. If the plan is not closely aligned to the assessment tool chosen, the assessments face validity will suffer. By creating the plan based on the assessment tool, we can ensure that the validity exists between the two. Some will contend that this is gaming the system. In fact, that is entirely true. The question that must be asked is whether or not gaming the system is bad. In most cases the answer is probably yes; gaming the system is bad. However, in this case, we have determined there is strong correlation between successful implementation of the aims of the assessment criteria and true progress in organizational improvements. That being the case, it is only wise to plan and execute according to the criteria.

SUMMING IT ALL UP

The PDA process begins with acceptance of the inadequacies in the traditional planning process. Frustration over lack of results and low assessment scores helps to prove the point. Confusion over how plans flow to all levels of the organization is another indication that the planning system is inadequate. Perhaps the most important indication you can have is that of dissatisfied customers. If any of these problems exist in your organization, it is time to start.

Once you have decided to PDA your planning process, you must prepare yourself and your personnel. In this stage, time must be set assessed to conduct the planning. Training must be provided to those who will get involved in the planning process so they understand what is to be done. This is also the time for the senior leaders to ensure that all personnel understand the need for such planning. Don't underestimate the need for this step. People need to know that the process they are about to enter is critical to the organizations success.

As with most other planning processes, an environmental scan is necessary before you continue. This includes identification of customers, suppliers, key result areas, key

processes, strengths, weaknesses, opportunities, threats, etc. The primary purpose for identifying these items should be to ensure that the plans you develop are in line with the actual needs of the organization - not the individual's perception of those needs. Of course these items are used for other improvements as well; nonetheless, the primary reason for the environmental scan is to create proper alignment for the organization.

Once the environmental scan is complete, the process of developing goals and objectives using the "catchball" approach begins. Continue on with the development of means, metrics, and action plans as previously discussed. Be sure to expand the involvement to the entire organization using a multitude of media.

Finally, ensure periodic reviews of the metrics being collected are conducted. All members of the organization should come to know these metrics intimately - not only their own, but those from other functional areas as well. Be sure to conduct a full self-assessment at least annually and attempt to correlate your periodic metric reviews with your full scale assessment. This serves to validate both assessment tools.

The key to the PDA concept is simplicity. We all build actions plans every day when we arrive at work. "What do I need to get done today "How will I do it?"?" "How will I know if I succeeded in getting it done?" Plans, method of execution, and concept of measurement. Imagine trying to get through a day just working on whatever task was closest. No rhyme or reason. Without a strategic plan, that is what the organization is doing on a large scale. You may have dedicated people working hard at their jobs, but where are they going?

There is an old adage, its origin I'm not sure, that says, "If you don't know where you are going, any road will get you there." Without a well thought out plan, involvement of your people, a method of execution and an assessment of your progress, you won't even know if you do get to where you are going! All of the teams that are working in your organizations, their efforts, time, and costs will produce less than what they are capable of in the absence of a solid foundation. Like a house, the foundation is simple and plain. Yet its function is more important than any other component in the house. The analogies are endless and each points to the same fact; lasting, conscious improvements are the result of focusing teams and tools to achieve the aims of a consolidated, organization wide plan.

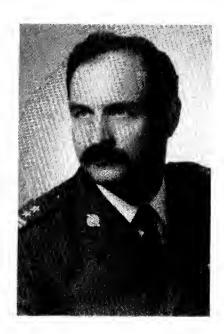
<u>REFERENCES</u>

Feigenbaum, A. (1991). Total Quality Control. New York: McGraw Hill.

Hellriegel d. (1992). Management. New York: Addison-Wesley Publishing Company, Inc.

Mason, R. (1991). Statistics, An Introduction. San Diego: Harcourt Brace Jovanovich.

Quality Air Force and Deming's Fourteen Points



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"QUALITY AIR FORCE "AND DEMING'S "FOURTEEN POINTS"

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ABSTRACT. As a result of the changing international and domestic environments the United States Air Force is in the midst of the most significant change since the end of the World War II. This enormous effort is being led by the Air Force senior leadership with a great deal of Total Quality Management (TQM) involvement. The application of the TQM philosophy to this military organization, known as Quality Air Force (QAF), is believed to be the right methodology for change. The main thesis of this paper is: The TQM approach in its pure form is not fully applicable to any military organization or military environment. Not TQM, but rather an adapted version should be implemented. According to many authorities, the success of this modern management philosophy has its roots in Deming's theories. Therefore, the Fourteen Points, as comprising the main principles of his teaching, will be surveyed, to test the main thesis of this paper by using the USAF, as the main example. The brief review indicates that from the Fourteen Points, nine are now fully applicable and in use under the QAF program. The rest of them are partly implemented. In the general analysis was deduced that QAF should not merely be more or less mechanically adopted or processed TQM, but should be expanded by adding specific methods more oriented toward "total quality command" as well. As a general conclusion it can be said that QAF's failure to make the proper adjustments to specific conditions or environments is the main reason limiting TQM implementation.

INTRODUCTION

As a result of the changing international and domestic environments the United States Air Force is in the midst of the most significant change since the end of the World War II. The process of reorganizing the Air Force goes from the top to the bottom. This enormous effort is being led by the Air Force senior leadership with a great deal of Total Quality Management (TQM) involvement. TQM is perceived as a method that should provide what seems to be impossible at first blush: not only maintaining, but also improving the quality of a downsized organization. Advocates of the application of the TQM philosophy to this military organization, known as Quality Air Force (QAF), believe that the more radical the reduction of the size of the military force be, the more significant role the appropriate implementation of TQM and of continuous process improvement will have as the right methodology for change.

The main thesis of this paper is: The TQM approach in its pure form is not fully applicable to any military organization or military environment. I deem that not TQM, but rather an adapted version should be implemented. Why?

First, I would like to begin my argumentation with the name itself, specifically addressing the initial word of TQM buzzword. The very adjective arouses my concern for it excludes critical thinking and requires taking one particular solution for granted. One may argue that *Total* Quality Management suggests management or leadership style composed of a total framework built around the concept of *Quality*. Another may argue that there is no implication that TQM requires individuals in an organization to be subordinate to or centrally controlled by some autocratic leader(ship). If that is so, how can this position be reconciled with the hierarchical nature of every military organization? Second, the implementation of the TQM approach seems to be appropriate

and natural for some areas or fields of military activity similar to the spheres of economics for which TOM was primarily designed. The scope of branches where this method is successfully used embraces all kind of companies working on production or in service fields. Consequently those areas of military activity that are similar in their nature to them - mainly support, logistics, and maintenance functions - are the "safe" fields auguring for the successful implementation of the TOM philosophy. On the other hand, those components of organizations which perform missions closely connected with combat - like: force application or force enhancement - by their nature do not seem to present the most favorable conditions for TQM experiments. Combat operations are quite different in nature, perhaps even the opposite of "production" or "rendering services." Fighting is a destructive not a creative process. Therefore the attributes of a good quality worker are not necessarily the same traits as a good soldier (airman, marine, sailor). On the contrary, the demands and expectations pertinent to civilian workers and soldiers are different, and sometimes opposite. Moreover, the very act of applying TOM terminology to combat situations makes that it sounds improper a certain degree it even sounds ridiculous. Arriving at a functional definition for the "customer" and then identifying: who that customer is, can be extremely difficult for a civilian company and even more so for the military. Like every successful movement, TQM claims many "founding fathers." Although the current quality philosophy is based primarily on the work of Deming, Juran, and Crosby, the scope of achievements and popularity place the name of W. E. Deming in the first position. According to many authorities, the success of this modern management philosophy has its roots in Deming's theories. Therefore, I am going to survey the main principles of his teaching looking for the answers to the two following questions. First, are those principles implemented in the Quality Air Force (OAF) approach? Second, if yes, to what degree is each principle applicable? The answers to those questions will allow me to test the main thesis of this paper, which I hope to prove by using this particular military organization, the USAF, as the main example. The choice is by no means accidental, for to my knowledge the QAF is the most advanced and holistic application of TOM among the other services in the American military establishment. The rationale of Deming's philosophy of management was described in the so-called "the Fourteen Points," which depict the main obstacles or barriers impeding the development of quality. In attempting to make a QAF assessment I am going to use Dr. Deming's terminology as milestones and tools, which I hope will provide a more systematic approach to my evaluation.

THE FOURTEEN POINTS IN QAF

1. Create constancy of purpose for improvement of product and service. There are in fact two messages in the First Point: that of knowing what to do—establishing constancy of purpose—and then doing your best at maintaining consistency of purpose. Only top management can make policy, establish the set of core values, chart the long-term course for an organization, and finally lead it tenaciously in the chosen direction. The present challenging international and domestic situation urged the USAF senior leadership to seek appropriate responses to the challenges. Therefore, while economic and political

¹ All the names of points and obstacles are quoted after: Mary Walton, The Deming Management Method, (New York: A Perigee Book, 1986). Chapter 3.

constraints affect the quantitative force structure, a plausible solution to the dilemma was adopted: stress quality and qualitative improvement. The implementation of TQM philosophy began with the adoption of the First Point. The following question: "...how can you build a Quality Air Force if you cannot say what the purposes of our organization are...," was asked by Gen. Merrill A. McPeak, when the USAF was at the starting point on its way down the quality road.² Subsequently, the Air Force senior leadership accepted that the quality principles would be used for formulating the general purpose of the organization (establishing constancy), and for accomplishing the objectives of the Those actions provide evidence of both transformation (maintaining consistency). complete understanding of the First Point by AF senior leaders and its full implementation. In the aftermath, the foundations for quality were soundly created by analyzing the AF mission, vision and core values. Thus, I conclude that this principle seems to be well-understood, fully accepted, and put into practice in the AF environment. 2. Adopt the new philosophy. In this Point Dr. Deming postulates the need for "a new religion" in which mistakes and negativism are unacceptable. However, the adoption of anything new is difficult, because people tend to resist change. The current AF policy pertaining to the application of quality is based on a tenacious recognition of this belief. OAF ideology is very intensively disseminated among AF personnel. It is done with such exaggeration that, in my opinion, may cause even the opposite effect: to create some forms of resistance. Even though I share the view that quality should be promoted and intensively deployed, any strong form of total social indoctrination may in fact be ignored by people while verbally being fully accepted. A case in point is the lack of authenticity on the part of senior leaders'-they content themselves with making declarations instead of showing the real acceptance of quality by their actions. This seems to be a very dangerous symptom threatening further quality employment. In conclusion I would say that although the Second Point is fully applicable and put into practice, the way in which it is applied may cause some reservations and as a result makes it ineffective, if not counter productive in the worst case.

3. Cease dependence on mass inspection. This hint means that quality comes only from the improvement of a process at its very beginning, not from inspection, traditionally performed at the end of the production process. Regardless of the many successful efforts aimed at increasing QAF deployment there are numerous obstacles that make it relatively more difficult in the military environment than in civilian institutions. An expanded institutional structure, which provides inspection function (e.g., I.G.) still exists. On the other hand, the role and mission of the inspection function are being changed nowadays. The experiment with the Quality Air Force Assessment (QAFA), conducted by the Air Mobility Command and then expanded to the rest of the Air Force shows that more emphasis can be put on self-assessment. The framework for assessment is provided by Quality Air Force Criteria based on the Malcolm Baldridge National Quality Award.³ However, implementing the self-assessment process will be probably neither an easy nor a painless procedure. Self-assessment is a very detailed, time-

² Gen. Merrill A. McPeak, Does The Air Force Have a Mission? Air Force Update, Secretary of the Air Force, Office of Public Affairs, Washington DC.

³ Quality Air Force Criteria 1993.

consuming process, especially during the introductory phase.⁴ The results of unit self-assessment are a validation of higher echelons to ensure that commanders implement QAF approach. It is worth mentioning that not only the implementation of the Baldridge Award in the QAF but the Award itself is questioned by some authors as ineffective, neither assuring achievement of genuine excellence, nor giving guarantee against failure in the real market to Baldridge winners.⁵ In conclusion, it can nonetheless be said that this Point is fully applicable and put into practice, although at first blush its title may be associated as being much closer to the domain of mass production than to military organizations.

4. End the practice of awarding business on price tag alone. Deming believes that an organization aspiring to quality is to view itself as one complete system, in which awarding should not be oriented on measuring individual performance, because "...reward for performance is like rewarding the weather man for a good day." Regardless of Deming's criticisms of performance appraisals, in the military field they do perform a number of valuable services when implemented properly, especially the promotion system, so crucial in a strictly hierarchical organization like the military. The military promotion system is based on achievements evaluation, and is to a certain degree contradictory to Dr. Deming's guidance, because it inevitably leads to rivalry. In the military, promotion is not only evaluation, it is in fact the very act of ranking people. Any informal, subjective system is unacceptable and formal criteria for promotions—linked to the organization's mission and additionally to customer satisfaction—provide solution to that problem. All in all it appears that the recommendation of the fourth point cannot be adopted fully in the military field.

5. Improve constantly and forever the system of production and service. Improvement of quality cannot be achieved only by worker's efforts, but must be originated in management. This guidance was followed precisely in case of the OAF program. That improvement, as not a one-time effort, is characteristic of the QAF approach. Numerous manuals, guides, and plans which describe TQM implementations in the military, emphasize the "Continuous Improvement Process." Nonetheless, without questioning their utility, I am convinced they are too general, and unless adjusted to the military environment they cannot be easily adopted by all the military officers. Fortunately there are more and more publications that are oriented toward filling the gap. For instance, Michael R. Schlegel presented an interesting proposition, appropriately tailored to the military environment.⁷ He suggested not only the five-step architecture for change (change the culture in the organization, understand, document, simplify, and provide automation) but gave also some guidelines which show how to select a process for improvement and make it work as well. Nevertheless, even this example does not testify persuasively for the possibility of implementing TQM methods in the realm of pure military missions. This is because all its authors' considerations are focused on strictly

⁴ The conclusions driven during one of the Air War College seminars—while the example of self-assessment of the hypothetical wing was being analyzed — entirely confirmed those disadvantages.

⁵ In: Senior Leader in the Quality Air Force-NS621. The last four articles discuss the issue.

⁶ Deming's opinion quoted after: Mike Bradley, Systematic Rewards, ibid. p. 17.

Michael R. Schlegel, TQM and continuous Process Improvement: Can We Make It Work? In: Senior Leader in the Quality Air Force -- NS 621 (Maxwell Air Force Base, Alabama 1993).

economic areas, which more appropriately pertain to the financial managers' or comptrollers' field rather than to the commanders' domain. As I have shown, all the necessary conditions are fulfilled to implement successfully the continuous improvement process within the USAF environment. Obviously, it means that the Fifth Point guidance is also satisfied.

6. Institute training. According Dr. Deming everyone must be well trained, since solid skills are essential for improvement. But in practice poor training and dependence on unintelligible printed instructions too often seem to be characteristic in American industry.8 On the other hand, the USAF policy and practice pertaining to this element of Deming's guidance are not only obeyed, but I think are also exceeded. They include training and, what is more important, education as well. Now there are many institutionalized courses dedicated to the subject of quality. The education and training strategy is focused on the preparation of all personnel: civilians, enlisted, and officers, and for playing different roles in developing a quality environment, as team member, leader, facilitator, or advisor. It also embraces higher positions like mid-level managers, senior leaders, and quality council members. In addition, this particular area also requires the participation of specific professional advisors, such as organizational psychologists. There are some publications that can provide an excellent guidance in how to avoid common pitfalls in team-training and team-building.9 These seem to be relatively easier tasks, for in fact team work is nothing new. Indeed, it is characteristic of military organizations. In summary, I would like to highlight the fact that the QAF program transcends requirements of the Sixth Point.

7. Institute leadership. It is a leader's job to help their people, not to judge them. It is important to know when their people need special help and to provide it. This particular point may be thought of as the most relevant and essential one for the application of the quality approach to the military organization. However, it does not add anything really new, since leadership traditionally has been practiced in the armed forces for ages. Obviously, there is no need to "institutionalize" something that not only exists, but also is routinely and successfully exercised. Yet, leadership may be seen as a novelty in the field of economics. Therefore, military experience with leadership may serve as an example for the civilian managers rather than the other way around. Today quality is perceived as a fundamental responsibility of leadership that cannot be delegated. However, some features pertaining to top leadership are absolutely crucial for TQM successful implementation. Those are connected with the leaders' prime obligation and ability to create and maintain an understanding of the vision. David K. Carr and Ian D. Littman stress the role of top leaders in developing a vision and energizing the effect in many governmental organizations including the military.¹⁰ Visions are developed by leaders, but to be successful they should meet the following requirements formulated by Dr. Deming. First of all, full acceptance is necessary-they must be shared by all the team and the leaders as well. Then, they must be comprehensible and precise. They are supposed to be detailed enough that everybody can participate. Finally, they should be

⁸ M. Walton, The Deming Management Method, (New York: A Perigree Book, 1986) pp. 35, 68.

⁹ The most useful and systematic seems to be The Team Handbook by Peter R. Scholtes. The article by Gregory E. Huszczo, Training for Team Building. Ibid. p. 29. contains also many valuable advice.

¹⁰ In: Excellence in government. Total Quality Management In The 1990s (Arlington, VA: Coopers & Lybrant, 1993) pp. 127-131.

positive and inspiring. While vision determines the destination, values settle the way in which one measures the direction in which the organization is headed. Top leadership commitment and support are essential to modern quality management. Without a doubt, I would say that this Point is relevant and fully adopted by the Air Force in the QAF program.

8. Drive out fear, so that everyone may work efficiently for the company. The removal or reduction of fear should be one of the first of the fourteen obligations which top management starts to implement, because it affects nine of the other points.11 Fear causes resistance to change, particularly if improvement efforts forced individuals to spend great amounts of exertion for opposing transformation that might have been used more productively in actual improvement's activities. The idea of empowerment seems to be very attractive, but I suspect that its full implementation in the military would be neither easy in some fields, nor possible in the others. It will demand the transfer of some power from the higher to the lower levels. In spite of their solemn declarations, probably not all commanders are so eager to deprive themselves of any portion of their power and its attributes. Consequently, the following questions should be posed: how to obligate commanders to do that, how much power, or what kind of decisions can be relegated without jeopardizing the vital interests of the military, and without threatening commanders' prerogatives? Providing a good answer is not easy, especially bearing in mind that the idea of empowering, leading as it does towards decentralization, is to certain extent contradictory with the hierarchical nature of any military organization. That factor is primarily important when taking into consideration the strictly combat operations the military is called upon to engage in. In the case of combat operations any concessions of hierarchy are not likely possible. Therefore I believe the application of this Point will be limited to non-combat areas only.

9. Break down barriers between staff areas. In practice it often happens that staff areas have conflicting goals (one department's goal may cause trouble to another) or are competing with each other. However, a survey made in the Air Force Logistics Command did not show that barriers of this kind are perceived to be a real threat, because the results that scrutiny does not contain barriers between staff areas.¹² Obviously it does not mean that barriers of this kind do not exist, they are just not perceived as significant. The conclusion may be that work organizations, awareness of common interests, and team spirit are at least satisfactory in the AF. In my opinion it is quite evident that to function efficiently each military organization had to do that a long time ago, before TQM was discovered. Moreover, attention should be paid to preventing the institutionalized forms of quality management to dominate the process itself. This sometimes happens even to the extent that institutionalized forms of quality management themselves are substantial obstacles to TQM. John MacDonald, while analyzing the main reasons for the failure of quality in the Air Force, indicates such a threat, describing how a proliferation of quality improvement teams, facilitators, coordinators, and centers "...establish a permanent ownership of quality," creating another fortress of

William W. Scherkenbach, The Deming Route to Quality and Productivity. Road Maps and Roadblocks, (Washington, DC. Milwaukee, WL: CEEPress Books, 1990) Chapter 6, p.75.

¹² Hal A. Rumsey Philip E. Miller, Barriers to Total Quality Management in the Department of Defense. In: Senior Leader in the Quality Air Force—NS 621 p. 48-51.

bureaucracy.¹³ In this case only the "quality people" are empowered to deal with the quality issue. Other can feel free of the obligation. Consequently, this Point, though relevant, does not seem so significant for QAF implementation, because the organization was seemingly able to avoid such a kind of barrier.

10. Eliminate slogans, exhortations, and targets for the workforce. Deming argues that imposed slogans, exhortations and targets may create adversarial relationships and "generate frustration and resentment."¹⁴ Studying numerous official USAF documents and publications, including but not limited to the QAF domain, I was amazed that the word quality is so overused. The propaganda of quality should be authentic, more subtle, and not limited merely to providing every single noun with adjective 'quality' regardless whether it describes something really new, specific to the quality approach, or whether it depicts ordinary procedures or things. Such a way of popularization can cause much more harm than good and may also arouse suspicion that, instead of authentic implementation, some organizations are merely interested in keeping up appearances. Therefore the results of the survey mentioned above in point nine, should not be surprising, that they showed the lack of worker motivation (rank 1) and the lack of effective communication (rank 4) among highly ranked barriers to TQM in the DoD.15 Such a high priority for that particular category (interface barriers) is partly related to the Tenth Point-ineffective implementation-which is among other things responsible for those negative occurrences. In short, popularization of quality by using slogans or establishing targets for the service members should be more authentic and created with their active participation. I would say that the Tenth Point is fully applicable though not quite efficient, because the common practice of spreading slogans instead of more subtle and useful popularization may threaten its usefulness or even make it counter productive. 11. Eliminate numerical quotas. According to Dr. Deming quotas and other numerical work standards impede quality. To be effective and profitable, quotas should be defined in terms of quality. The responsibility of supervisors must also be changed from emphasizing sheer numbers to emphasizing quality. Regarding the military field I would say that total elimination of numerical quotas is impossible. Some kinds of numerical quotas are necessary. They allow the organization to measure and compare varying level of mission accomplishment. However, they should be obtained as a result of reflection, after listening to those who "own" the process and to the customer, because the target (described in terms of numerical quotas) can be achievable only when it is a part of the system, and only then when the people have a chance to meet it. 16 As it was in the case of the former Point, the implementation of the Eleventh Point is not quite satisfied in the military field. According to Rumsey and Miller's survey, production quotas were ranked in the eighth place among the third category barriers to TQM in the DoD. Especially confusing for the workforce were contradictory demands: to produce to a certain level, but "to not sacrifice the quality of production to meet production quotas."17 Therefore, it

¹³ John MacDonald, Reasons for Failure. In: Senior Leader in the Quality Air Force—NS621 pp. 52-55.

¹⁴ Walton, The Deming Management Method, (New York: A Perigree Book, 1986) p.76.

¹⁵ Hal A. Rumsey Philip E. Miller, Barriers to Total Quality Management in the Department of Defense. In: Senior Leader in the Quality Air Force—NS 621 p.49.

¹⁶ In his book W. W. Scherkenbach gives excellent, also graphical, explanation of those relations. Ibid. pp. 86-88.

¹⁷ H. A. Rumsey... ibid. p. 50.

is important not to put too much emphasis on numerical results, or quality in its less easy to measure aspects will be neglected. There is also a strong connection between this guideline and the Seventh Point. A careful examination of the Twelfth Point assumes elimination of management by objective, by numbers, by numerical goals, while suggesting that they should be replaced by leadership. Thus, I would say that the Eleventh Point is also applicable, although its implementation faces some obstacles.

12. Remove barriers to pride of workmanship. Dr. Deming believes people are eager to do a good job and they are distressed when they cannot. This means abolishment of the annual or merit rating and reinforces the need to eliminate management by objective. The existence of these barriers in the military organization was confirmed by the results of the previously mentioned survey made by the Air Force Logistic Command. The corollary showed that a lack of worker motivation and a lack of effective communication were ranked at first and fourth place as obstacles to quality. It is interesting that the same obstacles were mentioned by Dr. Deming while describing Point Twelve. 18 Though both the above cited examples do not deal with strictly military combat tasks, this Point seems to be relevant and appropriate in the military context. In the TOM Guide the military leader is admonished "...you are responsible for maintaining each individual's sense of self-worth and self-esteem."19 I think there is no need to question the significance of the soldier's pride and spirit, as well as the influence of those elements on military performance in general and in the field of quality in particular. Therefore the relevance of the Twelfth Point to the QAF is proven, although I cannot confirm how successfully this Point is implemented in actual practice.

13. Institute a vigorous program of education and training (self-improvement). In the regard of this guidance there is not much more to add to what was said while the Point Six was considered, except for one more of Dr. Deming's relevant observations. The author noticed that as long as management treats people as a commodity, the need for education and training will not be recognized.²⁰ Obviously, in the military the human factor is always valued appropriately. Furthermore, the deeper understanding of the importance of this particular issue in the Air Force is absolutely crucial for the success of the QAF program. There are many examples that illustrate its comprehensive implementation on a daily basis. All Air Force organizations, whether aimed at a general purpose - like AETC - or specifically focused on quality issues - like Air Force Quality Institute - can serve as good examples of putting TOM ideology into practice. In addition, there are many other activities which support and popularize the QAF. For instance, the first annual Quality Air Force Symposium, which was organized in Montgomery, Alabama in the fall of 1993, enabled the consolidation of efforts, promoted competition among teams, and provided for a valuable exchange of experience among military and civilian people who quest for quality. It is clear that the implementation of the Thirteenth Point is also as well advanced as is the implementation of the Sixth Point.

14. Take action to accomplish the transformation. The last hint indicates how to organize effort to advance the thirteen other points. Deming suggests that a critical mass

¹⁸ Walton, The Deming Management Method, (New York: A Perigree Book, 1986). p. 82.

¹⁹ Total Quality Management Guide. A Two Volume Guide for Defense Organizations, (Washington DC.: Department of Defense, 1990. Volume II -- A Guide To Implementation.) p. 2-22.

²⁰ After W. W. Scherkenbacher, ibid. p.125.

of people in the company must understand the quality philosophy and participate actively to accomplish the transformation. It is by no means an easy QAF task for at least two reasons. First, the complexity and the magnitude of the organizational structure demand different approach as for companies of a big- mid- or small-size. In the case of such a huge organization as the Air Force, which is a multilevel, hierarchically structured, and formalized command and staff organization composed of numerous elements (each of them is, in fact, an organization itself), simple implementation of ready-to-use procedures without proper adjustment is neither possible nor advisable. Existing patterns appear to have been developed for industrial companies, indeed for smaller and less sophisticated Second, as John MacDonald indicates, the overall philosophy of quality management is being artificially divided by TQM consultants into two distinct and The two approaches are categorized as the competing implementation strategies. "overall culture change route" and the "project by project approach." According to MacDonald "the promotion of either approach as competing rather than as integral implementation philosophies is leading... into very dangerous waters."21 The Air Force was fortunate to avoid that pitfall. The strategy adopted by the Air Force -- accepting the QAF as the official approach to managing change - is based on a flexible attitude. The assumption was made that only the general foundations for quality would be centrally undertaken. These included establishing mission, vision, inclusive rules, and the general directions which secure achievement of the objectives. But the exact method or approach is left up to each organization to determine on its level. Doctor Deming also emphasizes the importance for people to work together with a mutual understanding of all the foregoing Thirteen Points while trying to accomplish them. That is only feasible in an organization that has been able to achieve that level of understanding by creating cultural change, or a new mind-set. All these measures should lead to creating the Quality culture in the AF as well. It also means that Point number Fourteen is fully adopted in the QAF practice

CONCLUSION

This survey of Deming's "Fourteen Points" was made in order to provide the answer to the question whether TQM works under the QAF program. The summary of my considerations is based on a simple mathematical calculus: comparing the number of analyzed Points, determining which are fully applied and which are partly utilized. I accept that this procedure may lead toward oversimplification, because neither all of the Fourteen Points are equally important nor their implementation was measured precisely. Nonetheless, it is one way to provide a factual foundation for an effective analysis of my thesis. The brief review indicates that from the Fourteen Points, nine are now fully applicable and in use under the QAF program. The rest of them are partly implemented. The very fact that no single Point was totally neglected may manifest the relevance of the TQM theory to the military environment and may also provide evidence of good application of that theory in the QAF approach. However, my survey showed also that five of the analyzed Points are not fully employed. It seems to confirm my assertion that not every area in the military environment, examined using the USAF example, is within the domain of TQM application. All the patterns described in the literature pertain to the

²¹ John MacDonald. Reasons for Failure. In: Senior Leader in the Quality Air Force-NS621 pp. 52-55.

specific, non-combat, and rather economic aspects of the functioning of military organizations.²² The outcome of the above calculus should not be surprising at all, taking into consideration that not every domain in the sphere of military activities can be subject to "management." Those spheres that are not susceptible to it are simply the domain of command, which must be exercised under actual or simulated combatant circumstances, when the object is to conduct real or virtual war. Attempts to implement the QAF procedures in real or simulated combat environments seem to me neither augur success nor even be harmless, because the QAF is essentially nothing more than the total quality management implemented within the environment of this particular organization. In short, TQM cannot be a proper tool for solving the kinds of problems for which the method was not designed. Moreover, treating TOM like a panacea can be, in my opinion, one of the reasons for failure. It deprives the OAF program of authenticity by creating some kind of a new cult with quality people in the role of priests. It may also lead toward improper, or ineffective implementation that ends up being more harmful than beneficial.²³ Consequently, command and control, which as a process is, in fact, quite different from "management" and requires a different approach. In the general analysis I deduce that QAF should not merely be more or less mechanically adopted or processed TQM, but should be expanded by adding specific methods more oriented toward "total quality command" as well. As a general conclusion it can be said that QAF's failure to make the proper adjustments to specific conditions or environments is the main reason limiting TOM implementation. It less not without good reason that President Clinton recommended that "appropriate adaptation" is necessary for making Total Quality Management effective in government.²⁴ The validity of the argument is even stronger for the military establishment since no other governmental organization is like the military establishment.

BIBLIOGRAPHY

Carr, K. David and Littman, Ian D. Excellence in government. Total Quality Management In The 1990s, Arlington, VA: Coopers & Lybrant, 1993.

Quality Air Force Criteria, Maxwell AFB, AL: Air Force Quality Center, 1993.

Quality Air Force Nomination PATs for AETC 1993. Team Quality Awards, Vol. I-III HQ AETC / QI, December 1993.

Scherkenbach, William W. The Deming Route to Quality and Productivity. Road Maps and Roadblocks, Washington, DC. Milwaukee, WI.: CEEPress Books, 1990.

Senior Leader in the Quality Air Force--NS 621, Maxwell AFB, Alabama: Department of National Security Studies, Air War College, Air University, November 1993.

Total Quality Management Guide. A Two Volume Guide for Defense Organizations, Washington DC.: Department of Defense, 1990.

Walton, Mary. The Deming Management Method, New York: A PerigeeBook, 1986.

Even newly published list of Program Action Teams that were nominated in AETC for Team Quality Award does not contain any example of pure military mission. The most often occurrings are teams working in: civil engineering, communications, or maintenance.

Although economic aspects of QAF were not a subject of my considerations, it is noteworthy that only comparison between the means spent on quality and gains provided by it would allow to assess the effectiveness of the quality implementation.

²⁴ "The ideas of W. Edwards Deming have become a powerfully effective force for change in American industry. With appropriate adaptation, Total Quality Management offers the framework and the tools to be equally effective in government." President Bill Clinton quoted after: Excellence in Government...

Quality Air Force... Let's Get Real



Capt Jim Fritz

Captain Jim Fritz has served the United States Air Force since 1980. Selected to attend Iowa State University under the AECP program, he graduated with a degree in Mechanical Engineering. Jim first became interested in TQM as an acquisition officer at the Ballistic Missile Office, Norton AFB, California. He served there as a quality advisor and was subsequently transferred to Air University to help start the (then) Air Force Quality Center. He was selected to be the first Quality Advisor at the Center and helped start both the Quality Air Force Educational Architecture Design Team and the Air Force Quality Council Working Group. For the last year, he has been working as a member of the research team at the Institute. Currently, he has completed his MBA at Golden Gate University. In January, Jim will be leaving the service to start his own consulting firm.

Quality Air Force...Let's Get Real

What is real about Quality Air Force? What will people say about what we have done here twenty or thirty years from now? This paper examines a way to ensure that our actions are not futile. This paper is about telling ourselves what we feel and believe to be the truth.

If you accept that introspection can sometimes reveal hidden truths, you have a foundation upon which to build concepts that you can use to help influence change in your organization or as a consultant charged to assist others. It is often tempting as we interact daily with others to ignore our hearts in order to achieve some short-term "success." We attempt to "rationalize" white lies in the Air Force by saying we will pick which organizational change battles are worth fighting. This allows us to let some things we know are wrong continue while we save our "silver bullets" for the "really important" issues. I submit that the tendency for the Air Force population to remain silent while activities we feel are potentially harmful continue is the really important issue. It slows the improvement of the organization and it crushes the individual. Given this fundamental premise, let's explore some "reality."

Fear in the workplace will negate the best efforts of teams to productively change the environment. Lt Col William Clark originally proposed this to the Air Command and Staff School in his 1948 thesis "Active Discipline in the USAF." His experiences as a fighter pilot during W.W.II convinced him that empowered airmen were inherently more effective in the air and on the ground. His study found that ratings given by external enforcers, such as the IG, related inversely to the squadrons' performance in the air. may be because fear on the ground does not lead to courage in the air. Former Chief of Staff David Jones was so concerned with this issue that after the Vietnam war he initiated a "pervasive program to promote total commitment to Air Force standards," which was to be a transfer from external enforcement of standards to individual accountability and self control. Air University promptly replied that all curriculum had been reviewed and found to be wholly in accord with the Chief's wishes. program was declared successful. If these concepts and events sound like Quality Air Force, they should. all, Lt Col Clark and Dr. Deming came from the same era. Total Quality relies on total commitment and intrinsic motivation. If a pervasive program was initiated twenty years ago and if Air University curriculum was aligned twenty years ago, why is external enforcement of standards still an issue? Worse yet, if fear in the workplace wasn't affected by an Air-Force-wide program, why should Quality Air Force be any different? One hope is that QAF will eventually lead us to view communication as a system. The communication model shows four basic steps: sender, signal, receiver, and feedback. A systems view of communications shows the need for increasing levels of feedback as a function of deviation of signal from target (system-wide perception of reality). Fear causes this system to become dysfunctional by masking feedback strength. That fear is expressed in terms like, "His fun meter is pegged on that issue," or "Don't bring me problems unless you have a plan to solve it." If we don't drive out fear, QAF will be remembered as just another program that wasted our time. If we have the internal courage to question and change the status quo, QAF will be lived instead of remembered.

Quality Air Force talks a lot about empowerment, decentralization, and process expertise. Process improvement speaks of eliminating non-value added steps in order to provide higher quality to the customer. A quality related initiative called "Pacer Share" even succeeded in reducing the many unneeded civilian ranks at Sacramento Air Logistics Center to four in an effort to make quality work. Why then, is no one in the Air Force doing anything about the many unneeded officer and enlisted ranks? While our army ranks may have been useful 200 years ago in a highly centralized army, of what possible use are they today? Instead of form following function, these ranks have forced us to make functions to follow the form. Each rank has associated with it the type of job that is appropriate to get promoted. This leads to useless layers of I know of one "team" that had eight people organizations. in four reporting layers. I bet you know of a few not so flat and not so empowered organizations like that too. many ranks are reached by us through an up-or-out selection system that ensures that people who are good at their jobs and want to stay and get even better will be forced out of the service. It is pretty hard to think of long-term improvement if you are moved and promoted based on yesterday's events. Finally, the many ranks to be filled drive us to spend inordinate amounts of time rating each other. One senior leader I talked to said that he spent 50-60 percent of his time working on OPR and promotion-related paperwork. None of this time adds value for the American taxpayer. Instead of complaining about manpower reductions making us a hollow force, let's stop wasting our time doing things that don't contribute to national defense. Air Force will not be "real" until we start working on the core inefficiencies of our system.

As quality trainers, we like to tailor our material to meet the needs of a particular audience. This gives us the ready excuse to create special "executive" level training for senior leaders. Unfortunately, the only need that is addressed in the training is the short amount of time leaders have to attend the class. As a result, we create two-hour briefings of complex material that talks about application and behavioral change. We call this Senior leadership training, but we are lying. The needs we should be looking at are the educational deficiencies of the students. For most quality training, senior leaders actually need more information and practice of new skills than the infamous "worker bees." Quality Air Force principles are not second nature to our leadership and we must quit pretending that they are. Our current method of training is not changing behaviors. This leads to cynics who rightly state that, like Chief Jones pervasive program of the seventies, "QAF will come and go but nothing will really change." That would be a sad epitaph for QAF in the year 2000.

It is part of our culture that we should be able to withstand pain. Unfortunately, this may appear to give license to accepting pain from our bosses and passing that pain to our subordinates. Sometimes, processes that needlessly cause difficulty for people are looked upon as character builders or training opportunities. This is especially true if new people or lower ranking people are the only ones affected. People who question these activities are sometimes looked upon as unable to stand the "stress" and not as people trying to improve processes. Since courage is a part of our culture, interventions by facilitators and consultants must be seen as projections of courage versus avoidances of pain. I believe the most effective way to do this is to base your intervention on quality principles, while recognizing fear in the environment. If you trust you heart and refuse to be seduced into telling "white lies," you can do both. If you have integrity as one of your core values, you can do nothing else.

Quality through an Understanding and Application of Profound Knowledge and Essential Process Management



Col Keith M. Perry

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Colonel Perry was one of the first to receive a certificate in Total Quality Management from American River College, the first college to offer a full curriculum in TQM. He is also a part-time instructor for the college.

In addition to his military quality activities, Colonel Perry was chosen by the Governor of California to teach TQM to state employees.

Quality
through an
Understanding and Application
of
Profound Knowledge
and
Essential Process Management

Keith M. Perry, Colonel, USAF SM-ALC/QI McClellan AFB CA

Abstract

One of the most difficult problems confronting any organization moving into the new quality model is that of analyzing its current operations and processes. (Gilbert and Nelson 145) Tools and techniques being used can not provide the understanding, of the interrelationships between systems and their environments, necessary to implement the quality Dr. W. Edwards Deming taught. Success stories are plenty, yet the quality being professed continues to suboptimize and work against the aim of the system. A new approach is needed. The quality approach organizations should be seeking "... depends on Profound Knowledge" (Gilbert and Nelson 75) and to meet the criteria of Profound Knowledge, in systems analysis, requires the application of Essential Process Management (EPM).

This paper presents an overview of Dr. W. Edwards Deming's System of Profound Knowledge and a new approach to systems analysis, Essential Process Management. The intent is to persuade the reader to question his/her theory on current organizational approaches to quality. The author hopes the reader realizes the necessity to begin a new approach to quality through an understanding and application of Profound Knowledge and Essential Process Management.

For a more in-depth study of Profound Knowledge, refer to the works of the British Deming Association, Deming, Gilbert and Nelson, and Scherkenbach. For more information on systems analysis, refer to the works of DeMarco, McMenamin and Palmer, and Yourdon, and for an understanding of systems analysis through the application of Essential Process Management and its link to Deming's Profound Knowledge, the work of Gilbert and Nelson.

A SYSTEM OF PROFOUND KNOWLEDGE

Dr. W. Edwards Deming's System of Profound Knowledge, introduced in 1987 as a theory for transformation of management (Deming 50), is composed of four interrelated components (Deming xi; British Deming Association Number 6: 2-11; British Deming Association Number 9: 3-20; British Deming Association Number W1: 1-7; Gilbert and Nelson 75-78):

- Appreciation for a system
- Knowledge about variance
- Theory of Knowledge
- Psychology

An understanding of Dr. Deming's System of Profound Knowledge begins with an appreciation for systems. Knowledge of the system gives the essential frame of reference that helps one to predict, and prediction is the basis for all action (Nelson). It is through an appreciation for a system that one comes to an understanding of Dr. Deming's philosophy calling for the full optimization of the system. Optimizing the system means that all components must work toward the improvement of the output of the system. This requires that each part of the system be evaluated on its individual (value added) contribution to the system's vision, not on its individual production of products or services, its profit margin, or any other competitive measure. Current quality approaches fail to take this into account. A new paradigm must be established wherein all components work to optimize the entire system, at times at the expense of individual components, so that the system is optimized creating a win-win situation for every component of the system over the long term. This is difficult to do when each component is driven by the "bottom line" mentality rather than working as a team to optimize the entire system.

The second component is *knowledge about variance*. This is the application of statistical methods to interpret past events with the aim of predicting future events as they apply to a system. It begins with an understanding of what variables are being inputted into a system by other interrelated systems such as the environment, equipment, methods, materials, and people. Next, one must have an understanding of the differences between a stable and unstable system and an understanding of special and common causes of the variation. With this knowledge, one can work to eliminate special causes and bring the system under control. Once the system is stable, and only then, can one predict the future and make improvements. Prediction and action based on an unstable system is, what Dr. Deming would call, tampering. Such an approach will increase the variability of the system and thus prevent system optimization.

The third component, *Theory of Knowledge*, requires observation of events based on past experiences and prediction of future events in order for knowledge to be conveyed. A critical aspect of understanding Profound Knowledge is an understanding of the relationship between prediction, knowledge, and theory.

According to Dr. Deming: (Deming 105 - 106)

Knowledge is built on theory. The theory of knowledge teaches us that a statement, if it conveys knowledge, predicts future outcome, with risk of being wrong, and that it fits without failure observations of the past.

It is extension of application that discloses inadequacy of a theory, and need for revision, or even new theory. Again, without theory, there is nothing to revise. Without theory, experience has no meaning. Without theory, one has no questions to ask. Hence, without theory, there is no learning.

Theory is a window to the world. . . . To copy an example of success (Benchmarking) without understanding it with the aid of theory, may (and often does) lead to disaster.

The *Theory of Knowledge* also allows for an understanding that there is no true characteristic, state, or condition definable in terms of measurement or observation. Changing any aspect of the means of gathering knowledge by measurement or observation, results in new findings. "Variance exists because of the differences in people and their bringing to any observation or measurement their own interpretation about what is important." (Nelson)

The understanding of the variance between people and the variance introduced into a system is developed through an understanding of the fourth component-psychology. "It is through the knowledge of psychology that (one) comes to understand interactions between people." (Gilbert and Nelson 77) People differ from one another and to understand a system, one must bring into that analysis an understanding of psychology. Instruments such as the Myers-Briggs and Keirsey-Bates Type Indicator Surveys, and the Kolb Learning Style Indicator, provide insight into the psychology of learning and teaching necessary to develop an understanding of human psychology.

The four components of Dr. Deming's Profound Knowledge are not independent entities, they *must* be taken together as a system. As a system, they open the door to understanding the "essence" and purpose "vision" of other systems. Until this is understood, no improvements can be made to any system.

Not until recently has a methodology been developed that allows one to more fully understand and apply Dr. Deming's System of Profound Knowledge and capture the "essence" of a system. This methodology is known as Essential Process Management.

ESSENTIAL PROCESS MANAGEMENT

The application of Dr. Deming's System of Profound Knowledge to systems analysis, and understanding of the "essence", can not be done using existing tools. What is needed is a methodology that provides "... a view of a system that encompasses not only the normally analyzed and documented inputs and outputs, but also accounts for the sociopolitical, that is, the human side, and the technological inputs and outputs." (Gilbert and Nelson 147). The approach must also "... acknowledge that every process/system has sociopolitical and technological impacts on the surrounding environment." (Gilbert and Nelson 147) One that "... gives

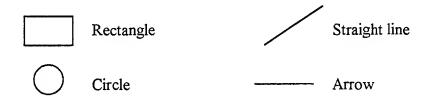
recognition to a system wherein the interrelationships between the various facets of any one single process and/or system with all other processes and systems are identified and documented." (Gilbert and Nelson 147)

In the early 1980s, Ardel E. Nelson, then employed at McClellan AFB CA, developed a methodology that came to be called Essential Process Management (EPM). Based on ". . . the structured technique work of DeMarco [1978] and especially through the follow-on work of McMenamin and Palmer (1984) in their work in essential analysis", (Gilbert and Nelson 146-147) EPM provides the methodology to understand the "essence" of a system and begins to meet the criterion of Dr. Deming in his writings on Profound Knowledge.

Essential Process Management encompasses three phases of analysis:

- Essential Process Analysis (EPA)
- Essential Quality Analysis (EQA)
- Statistical Process Control (SPC)

Essential Process Analysis, the analysis of processes for value added, only uses four graphic symbols to illustrate the total complexity of a system. This is a great simplification from the sixteen-plus American National Standards Institute (ANSI) symbols organizations are now using.



The rectangle represents the external suppliers and customers of the system and are elements that are not to be analyzed. The circle, also referred to as a "bubble" represents the system's processes. It is within these bubbles that value is added to inputs to produce outputs. Straight lines represent resting places. Named for the physical location (desk, warehouse, file drawer, etc.,), resting places show where something is waiting to be acted on by some element of the system. Arrows show the flow of whatever is moving in the system, both internal and external to the system. An example of a process flow diagram is shown in Figure 1.

The visual depiction of a system through the use of these four symbols produces a process-flow diagram (PFD). Further definition of the system is done through an analysis of each lower level of the process and the corresponding data dictionary (DD) entries. The aim of the data dictionary is to remove variance in understanding the terms used to name the arrows and files of the PFD.

The data dictionary uses the following notations:

is composed of or is equivalent to

+ and

{} iterations of the component enclosed

ieither/or i.e., select one of the options enclosed in the brackets

the enclosed is optional

* narrative comments *

** alias(es) **

Thus a term would be defined in the following manner:

```
term = required components +

(optional components) +

{iterative components} +

[selective components

one or more of components] +

* narrative comments *

** alias(es) **
```

An example of a data dictionary is shown in Figure 2.

"Essential Process analysis continues downward, subitem, by subitem, subprocess by subprocess, until the 'bottom' is reached." (Gilbert and Nelson 148) This downward analysis proceeds "... until the basic task level of the multiple tasks that are combined to make up a process is reached." ... "In addition, the definition of those inputs and outputs (and/or file references) [as defined in the DD] contain terms that are fundamentally self-defining, that is, do not themselves consist of elements that have multiple levels of further defined terms." (Gilbert and Nelson 149)

The next phase, Essential Quality Analysis (EQA), provides for "... the standardization of processes and the incorporation of never-ending improvement in all elements [of the process]." (Gilbert and Nelson 155) Essential Process Analysis started out incorporating the initial four elements of Walter Shewhart's Plan (P), Do (D), Check (C) [some now say Study (S)], and Act (A) continuous improvement cycle. It has since been modified to "... add the essential link to the outside world of providing for the essential support, and obtaining resources necessary, to accomplish the four taskings of plan, do, check, and act" (Gilbert and Nelson 151) This is now known as the (P), (D), (C)/[S], (A), (S) (Support) five-step process as shown in Figure 3.

The approach to what a plan is and the method used to enhance the communication of the plan are major differences between EPM and conventional system analysis methodologies. "In EQA, [which has] been developed far beyond the basic concepts of Imai (1986) and Mizuno (1988)" (Gilbert and Nelson 153), a plan must consist of the identification of six elements listed below:

- The Who, that is who is the agent that is to perform the action? What talents, skills, and competencies are required?
- The What of the process, that is, the identification of the principle steps in broad terms that are accomplished by the process to produce the output.
- The Why of the process, which is the link with the external customer and validates the reason for the process in the first place.
- The *Where* of the process, which is the identification of the geographic/physical location of process performance.
- The When of the process, which identifies the total timing of the process including all of its substeps and timing sequence.
- The *How* of the process, which is a detailed description to be followed by the person actually doing the action and which will enable the output of the process to be accomplished in quality terms, that is, with minimal variance every single time. (Gilbert and Nelson 153)

The enhancement of the communication of this plan is done through a modified version of the fishbone or cause-and-effect diagram as explained by Gilbert and Nelson:

The standard Ishikawa diagram, ..., uses brainstorming to fill out the various legs that lead to the cause-and-effect relationship between the process being analyzed and what contributes to that process, or problem/process analysis. In problem analysis, the EQA approach uses the same identification and identical content of each leg every time. Hence, in EQA terminology, it is referred to as a Standardized Cause and Effect Diagram (SCED) as shown in Attachment 4.

This SCED, identifying the who, what, why, where, when, and how for each and every single step is laid out for each of the P-D-C-A-S elements. Thus, for any single process . . ., [one] would have the five steps of plan, do, check, act, and support and the six elements of the SCED, the who, what, why, where, when, and how for each of those five. (154)

It is not until "... the alignment of processes for value added to the external customer and their initial qualitative standardization as (P-D-C-A-S and SCED) [are accomplished that the] quantitative standardization as effected through Statistical Process Control (SPC) [is attempted]. (Gilbert and Nelson 156) Beginning process improvement through the application of SPC to existing processes causes organizations to spend time, money, and human effort improving processes that do not add value in support of the external customer.

Gilbert and Nelson also explain that by applying EPA and EQA techniques before SPC, you get an additional benefit:

"... that within the data dictionary every single possible variable and attribute of the process that could be measured has been identified. Thus, once the plan is in place and the data dictionary has been defined, individual and team efforts can now be focused on implementing the necessary techniques to bring processes that are already known to add value into Statistical Process Control, and, thus, prepare them for the next level of improvement effort. (156)

There is an aim of EPM beyond flowing processes, defining terms, standardizing processes, and the incorporation of never-ending improvement.

In its totality, the EPM documentation is designed to replace all existing documentation in an organization from its basic regulations to job descriptions, and even to training plans for the individuals occupying the jobs. The process-flow diagrams used in EPM, with the "bubbles and arrows," visually depict the total process, including all of the inputs and outputs through every single step of the operation. The data dictionary defines each of the inputs and outputs in a totally unique manner, that is, not only as a description of what is required in each job, but as an internal quality control that incorporates self-management of each process and its relationship to the voice of the customer. (Gilbert and Nelson 148)

Thus, it is through an understanding of the components of Dr. Deming's System of Profound Knowledge that one can begin to understand and appreciate the complexity and interrelationship of systems and their components and the system's environment. Change any aspect of a system and the entire system changes and, when a system changes, it in turn affects its environment and other systems.

Although this paper's overview of Essential Process Management relied heavily on the works of Gilbert and Nelson, this author, as a student of Deming and Nelson, lives and teaches the essence of their work through his position as a part-time Total Quality Management instructor for the Los Rios Community College District, as quality advisor to the Sacramento Air Logistics Center Commander and senior staff, and as an instructor and mentor for the Governor of California's Quality Task Force. when a system changes, it in turn affects its environment and other systems.

Justice can not be done by this short overview of Profound Knowledge and Essential Process Management. Much of what has been said in text is better understood through graphical presentation of the concepts and would require a more lengthy paper. Even so, it is the hope of this author that what has been presented does interest the reader enough for them to form their own theory about the manner in which quality is being approached and to undertake further study of Profound Knowledge and Essential Process Management. Failing to do so will only continue the status quo, suboptimization of systems, and ensure failure to achieve the level of quality Dr. W. Edwards Deming taught.

Fig. 1. Process Flow Diagram Example

8.8 CONTEXT LEVEL

Fig. 2. Data Dictionary Example

need for [(pen)/(pencil)/(8.5 % ll"
paper) / (overhead marking
pen) / (handout) / hors d'oeuvre) /
(drink) / (napkin) / drinking

11

need for supplies

| (sself

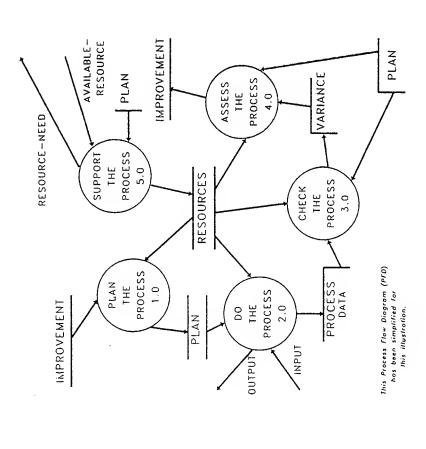


Fig. 3. Plan, Do, Check, Act, Support Example

Gilbert, G. Ronald, and Ardel E. Nelson. Beyond Participative Management: Toward Total Employee Empowerment for Quality. New York: Quorum Books, 1991: 152.

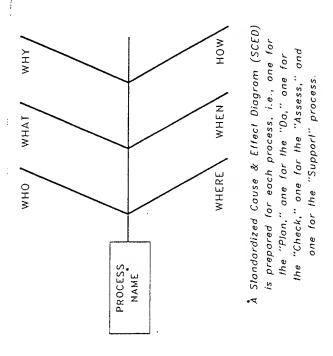


Fig. 4. Standardized Cause-and-Effect Diagram Example

Gilbert, G. Ronald, and Ardel E. Nelson. Beyond Participative Management: Toward Total Employee Empowerment for Quality. New York: Quorum Books, 1991: 155.

Works Cited

- British Deming Association. <u>A Perspective on Dr. Deming's Theory of Profound Knowledge</u>, Booklet Number W1. Knoxville, TN: SPC Press, Inc, 1992.
- ---, Profound Knowledge, Booklet Number 6. Knoxville, TN: SPC Press, Inc, 1992.
- ---, A System of Profound Knowledge, Booklet Number 9. Knoxville, TN: SPC Press, Inc, 1992.
- DeMarco, Tom. <u>Structured Analysis and System Specification</u>. New Jersey: Yourdon Press Prentice-Hall, Inc., 1978.
- Deming, W. Edwards. A System of Profound Knowledge. Unpublished essay, 1990.
- Deming, W. Edwards. <u>The New Economics for Industry, Government, Education</u>. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study, 1993.
- Gilbert, G. Ronald, and Ardel E. Nelson. <u>Beyond Participative Management: Toward Total Employee Empowerment for Quality.</u> New York: Quorum Books, 1991.
- McMenamin, Stephen M., and John F. Palmer, <u>Essential Systems Analysis</u>. New Jersey: Yourdon Press Prentice-Hall, Inc., 1984.
- Nelson, Ardel E. Thoughts on Dr. Deming's Profound Knowledge. Unpublished essay, 1992.
- Scherkenbach, William W. <u>Deming's Road to Continual Improvement</u>. Knoxville, TN: SPC Press, Inc, 1991.
- Yourdon, Edward. Modern Structured Analysis. New Jersey: Yourdon Press, Prentice-Hall, Inc. 1989.

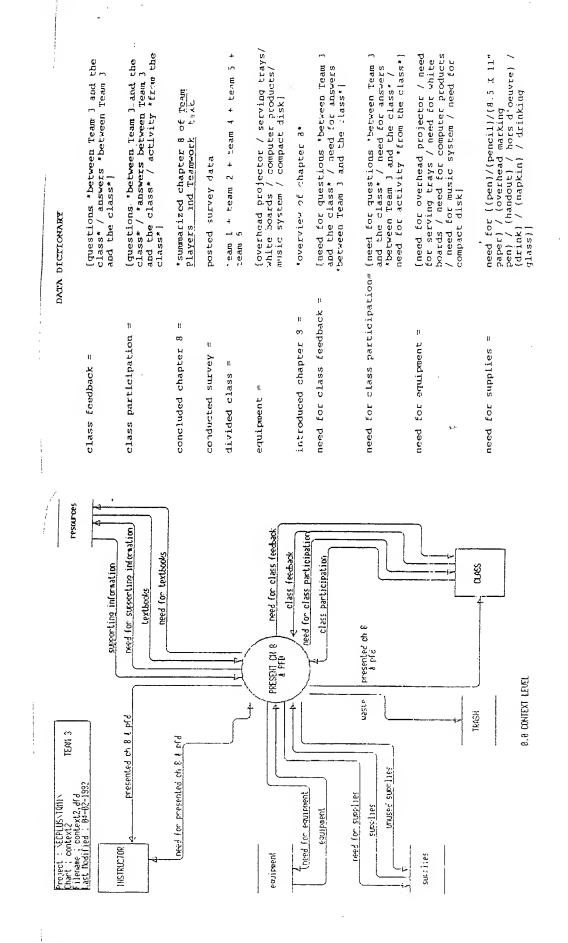


Fig. 1. Process Flow Diagram Example

Fig. 2. Data Dictionary Example

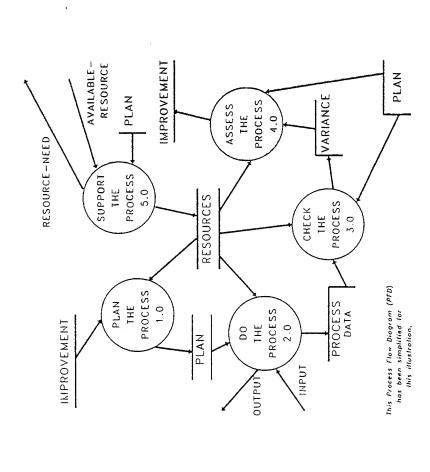


Fig. 3. Plan, Do, Check, Act, Support Example

Gilbert, G. Ronald, and Ardel E. Nelson. Beyond Participative Management: Toward Total Employee Empowerment for Quality. New York: Quorum Books, 1991: 152.

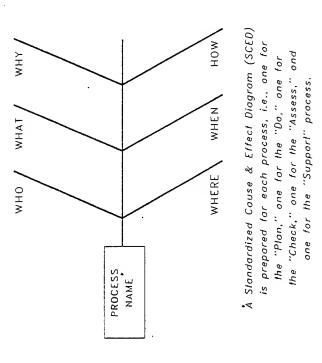


Fig. 4. Standardized Cause-and-Effect Diagram Example

Gilbert, G. Ronald, and Ardel E. Nelson. Beyond Participative Management: Toward Total Employee Empowerment for Quality. New York: Quorum Books, 1991: 155.

The Road to Quality



1st Lt David S. Smith

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THE ROAD TO QUALITY

1 Lt David S. Smith 1st Civil Engineer Squadron

ABSTRACT

Recently, more businesses and organizations have a desire to implement quality in management and in the work place, because they have seen success stories in Japan and the United States, and the Air Force is no exception. However, every organization has a unique climate and, therefore, a different road to quality. For example, strategies that Chrysler found successful will not likely lead to success in the Air Force. Dr. W. Edwards Deming recognized this difference and provided the best application directly for the military: "In most governmental services, there is no market to capture. In place of capture of the market, a governmental agency should deliver economically the service prescribed by law or regulation. The aim should be distinction in service. Continual improvement in government service would earn appreciation of the American public and would hold jobs in the service, and help industry to create more jobs." Similarly, each organization within the Air Force has a unique application of quality. Only by studying the innovators of the quality movement, can we see why Chrysler was successful and how we can apply quality to our unique products and services. This paper will focus on three of the minds whose ideas continue to drive the quality revolution: W. Edwards Deming, Joseph M. Juran, and Genichi Taguchi. Deming shows how to establish a quality environment, Juran demonstrates the quality improvement process, and Taguchi targets the fine tuning of the quality engineering process. By studying each author in turn, we will see a natural progression that each company must take on the road to quality.

DEMING QUALITY

Dr. W. Edwards Deming is perhaps the best known scholar on quality. His work in transforming the Japanese economy earned him the Second Order Medal of the Sacred Treasure by the emperor of Japan in 1960, which in turn led to the institution of the annual Deming Prizes for contributions to the quality and dependability of production.

Dr. Deming focused on breaking down any management technique that impedes improvements to production. He dispels the myth that poor performance is typically due to poor attitude and a lack of effort by the work force. It is typically barriers created by management that keep the production worker from being able to obtain pride of workmanship. Deming's philosophies pave the way for creating an environment in which quality can take place.

In Deming's 14 points, he outlines a system of success for management to allow quality to work. Although they are based on lessons for Japan's top management in the 1950s, the points disclose flaws in popular American management styles. The 14 points apply to government agencies as well as production and service industries. They can be applied to companies and divisions within an organization. Every group will have a unique application of the 14 points, so they are simply presented in a condensed form as follows:

- 1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.
- 2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
- 3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
- 4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.
- 5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
- 6. Institute training on the job.
- 7. Institute leadership (see Point 12 ...). The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.
- 8. Drive out fear, so that everyone may work effectively for the company.
- 9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.
- 10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.
- 11a. Eliminate work standards (quotas) on the factory floor. Substitute leadership. b. Eliminate management by objective. Eliminate management by numbers,
- numerical goals. Substitute leadership.
- 12a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.
- b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, *inter alia*, abolishment of the annual or merit rating and of management by objective.
- 13. Institute a vigorous program of education and self-improvement.

14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.²

Deming's 14 points are usually met with initial skepticism. The points seem to go against many of the management methods that are inherent in America. Indeed, companies that attempt to adopt the 14 points will fail unless they overcome what Deming terms as deadly diseases. The deadly diseases are barriers that require reconstruction of Western management:

- 1. Lack of constancy of purpose to plan product and service that will have a market and keep the company in business, and provide jobs.
- 2. Emphasis on short-term profits: short-term thinking (just the opposite of constancy of purpose to stay in business), fed by fear of unfriendly takeover, and by push from bankers and owners for dividends.
- 3. Evaluation of performance, merit rating, or annual review.
- 4. Mobility of management; job hopping.
- 5. Management by use only of visible figures, with little or no consideration of figures that are unknown or unknowable.
- 6. Excessive medical costs.
- 7. Excessive costs of liability, swelled by lawyers that work on contingency fees.3

In addition to the deadly diseases, Deming lists a selection of obstacles to applying the 14 points. In fact, any reason that the 14 points have failed or will fail is considered an obstacle. Deadly diseases could be classified as those obstacles that are the most difficult to overcome. Deming fails to list all possible obstacles, and any attempt to foresee all of them would be impossible.

The road to implementing quality begins with Deming, because it provides an organization with a working environment that allows quality to exist. Management should first identify the deadly diseases and plan to abolish them or work around the barriers that they will present. Once the diseases have been addressed, Deming's 14 points should be implemented and continually enforced. On planning this implementation, some obstacles will be foreseeable and should be addressed accordingly. Other obstacles will appear without warning and should be quickly identified and dealt with. After a quality environment has been established, quality design can begin. Dr. Joseph M. Juran takes over where Dr. Deming leaves off by describing a method of quality planning.

JURAN QUALITY

While Deming may seem to call for a complete change in management focus, Juran is quick to point out that the importance of quality has been on the rise since

before the 20th century. The desire to produce products at high quality with low cost has never changed. What have changed are the strategies to manage quality.

Throughout history the systems in which producers operated became more complex. To meet the changing conditions, companies had to change the strategies for managing quality. Figure 1 depicts the relationship between changing forces and quality strategies:

	STRATEGIES ADOPTED IN
CONDITIONS, FORCES	MANAGING FOR QUALITY
Food gathering	"Incoming" inspection by
	consumers
Division of labor: food suppliers	Inspection by consumers in village
	marketplaces
Early manufactures; rise of	Reliance on skill and reputation
village craftsmen	of craftsmen
Expansion of commerce beyond	Specifications by sample; export
village boundary	controls by inspection; warranties
The guilds	Specifications: materials, processes,
	products; export controls; audits
The Industrial Revolution	Written specifications; measurement,
	instruments, test laboratories;
	extension of inspection; standardization
The Taylor system	Central inspection departments
Growth of volume and	Quality assurance departments; quality
complexity	engineering; reliability engineering
World War II	Training in statistical quality control
Life behind the quality dikes	Special organization and processes to
	protect society; audits
The Japanese Revolution in	Upper management personally in charge
quality (Japanese strategies)	Training in managing for quality
	rraining in managing for quanty
	extended to all functions
	Quality improvement at a continuing
	revolutionary pace
	QC circles
The Japanese revolution in	Efforts to restrict imports
quality (U.S. response)	Numerous strategies undergoing test

Figure 14

Society has now entered into what Juran refers to as life behind the quality dikes. Technology has provided us an abundance of complex systems, many of which have to work together in harmony. For instance, air conditioning, or HVAC, is a mechanical process that has become an assumed comfort of living in the late 20th century. In addition, HVAC has afforded us the ability to run complex computer equipment which would otherwise malfunction under the heat load they produce. One malfunction in a critical HVAC component could cause a domino equipment failure effect that could halt critical communications or even endanger

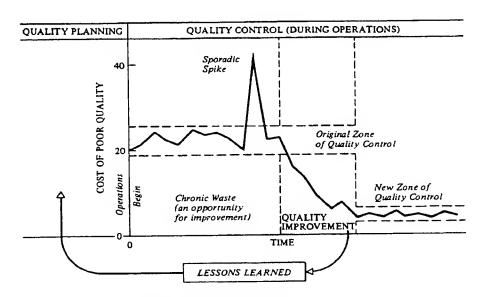
life. Our need for quality in HVAC service grows as does our dependence on the benefits it provides. Besides the dependence on technology, other factors have contributed to the need to focus on quality: growing environmental awareness, increased liability claims in the courts, growing cost of natural disasters, pressure from consumer organizations, and awareness of quality's role in international competition.

Similar to Deming, Juran confirmed that Japan created an environment in which quality blossomed. Juran identified four strategies that aided in the quality revolution: upper management in charge, training for all functions at all levels, quality improvement at a continuing--revolutionary pace, and work-force participation through QC circles.⁵

Upon close inspection, Juran's strategies are similar to Deming's 14 points: create constancy of purpose [point 1], institute training on the job [6], institute a vigorous program of education and self-improvement[13], put everybody in the company to work to accomplish the transformation [14].

Juran establishes that Japanese management set up a quality environment and then expounds to the next step, managing for quality. Figure 2 illustrates Juran's three universal processes to managing for quality: quality planning, quality control, and quality improvement. Together, these are known as the Juran Trilogy[©].

QUALITY IMPROVEMENT



The Juran Trilogy diagram

Figure 26

Quality planning consists of identifying the customer and the customers needs, developing product features that meet the needs of the customer, establishing processes that produce the product features, and transferring the plans to the production line. Similarly, quality control is based on measuring product performance against projected goals, and acting on any variation. This is comparable to the Air Force Quality Performance Measure process.

The most crucial part of the Juran Trilogy process is to diagram the quality improvement process. The first step in the improvement process is to establish the infrastructure, a quality environment with upper management support. The projects that require improvement are then assigned teams. The teams are empowered with the resources, motivation and training to diagnose problems, implement solutions, and establish controls to maintain improvements. The lessons learned from the improvement process are then applied to future quality planning.⁷

These processes give organizations a quality management tool to study work areas and make improvements. The trilogy technique is ineffective, however, unless the organization has first created a quality culture. After creating the quality environment and improving the organizational processes, the quality machine is in full motion. However, there are still improvements to be made to the quality department.

Juran touches on the fact that confusion sometimes arises when managers talk about quality. Two managers may agree that quality means satisfying the customer. One manager may define quality as efficiently meeting customer needs and thus assigns a cost savings to quality. Another manager may define quality as effectively meeting customer needs and attributes a cost increase to quality. Dr. Genichi Taguchi tackles this contradiction by demonstrating the customer's target value of satisfaction. Any deviation from this target value results in quality loss to society when measured as a whole.

TAGUCHI QUALITY

After establishing a quality environment and quality management, the next step is to institute quality engineering. The goal of quality engineering is to reduce the variability of the products that come off the assembly line.

Through an application of statistical methods, Dr. Taguchi brought the engineering of quality to the Japanese marketplace. Through the application of Taguchi techniques, organizations can justify further product improvements and estimate the quality savings from the adjustment. Dr. Taguchi leads perhaps the most advanced study of quality, and his methods should not be implemented until a unit has a solid grasp on quality management and continuous improvement.

The Taguchi loss function describes the value lost from a product due to variation from an ideal target:

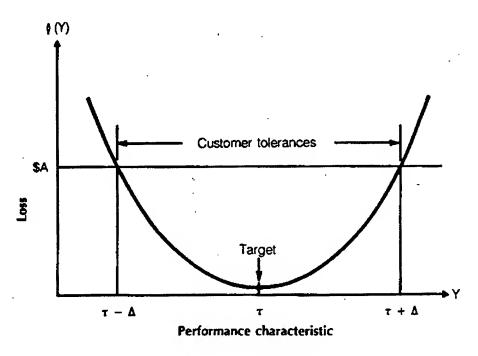


Figure 38

When processes are out of control, classified as a sporadic spike by Juran, performance characteristics will usually be outside of customer tolerances. The Juran Trilogy diagram illustrated that there is operational variation within the zone of quality control. Loss occurs when variability enters into the production process from either flaws in the process or from normal production variability called noise. There are three factors that cause variability or noise in a product function: external noise, internal noise, or unit-to-unit noise.

External noise is a result of the external environment. Factors such as temperature, humidity, and air quality, which vary on a day-to-day basis, result in variances in product reliability. Human variance is also an external factor such as what time of day a product is made. Internal noise is a result of the aging of a product either through natural wear and tear, or through a limited shelf life. The end product will tend to increase in variability as the raw materials and equipment age. Unit-to-unit noise, also called variational noise, is a natural variance that would occur despite identical inputs and manufacturing conditions. No two products will ever be replicated exactly.

The ultimate goal of Taguchi methods is to reduce the effects of noise through three design steps. System design is the first design phase where the customer's needs are established and the most appropriate solution is picked from the available technology. Taguchi then lists parameter design in which the optimum working conditions are established for the production process. The goal of this step is to improve quality by maximizing the efficiency of the work environment. The last

design phase is tolerance design, or the design of a product to reduce the effects of noise.9

It is relatively easy to relate the first two design steps to the Juran Trilogy. The product is first designed for quality and then the process is allowed to run while improvements are sought. Taguchi's methods are simply the next logical step in the quality process. Tolerance design methods, however, cannot be effectively implemented until after the other steps have been accomplished.

CONCLUSION

It is important to note that investing resources into reducing variability is unjustified if the process can be taken to a new zone of quality control through Juran's quality improvement techniques. Likewise, a quality improvement team cannot implement an improvement unless the highest management has already established an environment that empowers the team to make changes to established processes.

In making this point, I have abbreviated the teaching of Drs. Deming, Juran, and Taguchi, and for that I apologize. But the fact remains, each of these great minds in the quality arena provided different emphasis on these steps a company must take on the road to quality:

- 1. Break down the barriers to establishing a quality environment and identify obstacles that present themselves.
- 2. Establish a quality culture with direction, top management support, and a desire to improve throughout the organization.
- 3. Evaluate the organization's processes and provide the resources and training to improve the processes.
- 4. Work to improve productivity and minimize variability in the production process.

The destination of this quality journey is an organization with employees who take pride in their work. They come to work looking forward to accomplishing organizational goals, and go home knowing that their work has improved tomorrow's efforts. Only a focus on total quality will ensure the long term existence of any organization. As managers, our challenge is to maintain that focus not so much on making improvements on our products and processes, but rather, on making improvements for our customers and employees. Ultimately, they, not we, are what keep any organization in business.

BIBLIOGRAPHY

Dehnad, Khosrow. <u>Quality Control, Robust Design, and the Taguchi</u>
<u>Method</u>. Pacific Grove, CA: Wadsworth & Brooks/Cole Advanced Books & Software, 1989

Deming, W. Edwards. <u>Out of the Crisis</u>. Cambridge: Massachusetts Institute of Technology, 1986.

Taguchi, Genichi. <u>Introduction to Quality Engineering</u>. Trans. Asian Productivity Organization. Tokyo: Quality Resources, 1983.

Juran, Joseph M. <u>Juran on Leadership for Quality an Executive Handbook</u>. New York: Free Press, 1989.

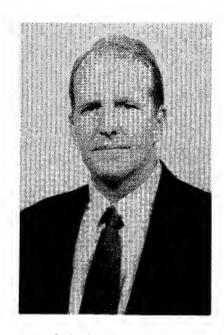
Juran, Joseph M. <u>Juran on Quality by Design</u>. New York: Free Press, 1992. Juran, Joseph M. and Frank M. Gryna. <u>Juran's Quality Control Handbook</u>. 4th ed. New York: McGraw-Hill, 1988.

Ross, Phillip J. <u>Taguchi Techniques for Quality Engineering</u>. New York: McGraw-Hill, 1988.

WORKS CITED

- ¹W. Edwards Deming, <u>Out of the Crisis</u> (Cambridge: Massachusetts Institute of Technology, 1986), 6.
- ² W. Edwards Deming, <u>Out of the Crisis</u> (Cambridge: Massachusetts Institute of Technology, 1986), 23-24.
- ³ W. Edwards Deming, <u>Out of the Crisis</u> (Cambridge: Massachusetts Institute of Technology, 1986), 97-98.
- ⁴ Joseph M. Juran, <u>Juran on Leadership for Quality</u> (New York: Free Press, 1989), 11.
- ⁵ Joseph M. Juran, <u>Juran on Leadership for Quality</u> (New York: Free Press, 1989), 13.
- ⁶ Joseph M. Juran, <u>Juran on Leadership for Quality</u> (New York: Free Press, 1989), 23.
- ⁷ Joseph M. Juran, <u>Juran on Leadership for Quality</u> (New York: Free Press, 1989), 45.
- ⁸ Dehnad, Khosrow, <u>Quality Control, Robust Design, and the Taguchi Method</u>. (Pacific Grove, CA: Wadsworth & Brooks/Cole Advance Books & Software, 1989), 8.
- ⁹ Genichi Taguchi, <u>Introduction to Quality Engineering</u> (Cambridge: Massachusetts Institute of Technology, 1986), 73-75.

Total Quality Implementation in a Large Test Organization



Col Elton T. Pollock

Mr. Elton Pollock recently retired from the U.S. Air Force. During recent assignments as Commandant, USAF Test Pilot School at Edwards AFB, and as Commander, 46th Test Wing at Eglin AFB, he led Qualtiy Management implementation efforts. Major improvements such as reducing the aircraft fleet by 50% while maintaining sortie output resulted from these implementations. A nationally recognized quality measurement system was key to this success. Mr. Pollock has authored articles on quality measurement and appeared as a panelist on the nationally televised U.S. Chamber of Commerce Symposium on quality measurement.

TOTAL QUALITY IMPLEMENTATION IN A LARGE TEST ORGANIZATION

Col Elton T. Pollock 46th Test Wing, Eglin AFB, FL

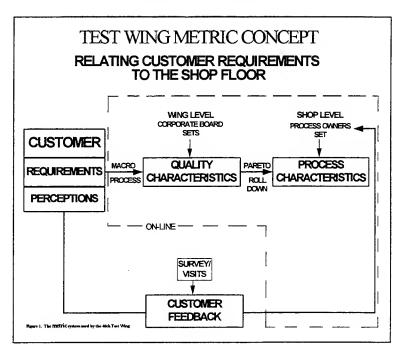
The 46th Test Wing's Quality Program results in concrete productivity enhancements. This paper describes the Wing's use of a closed-loop metric concept and provides examples highlighting the results of the application of this concept. This paper also shows how past successes and day-to-day metrics have been used as tools in the Test Wing's ongoing strategic planning efforts. This combination is leading to even further cost-savings, while improving their test capabilities and maintaining a customer focus.

Introduction

With the ever-changing world threats, reduction in defense budgets and force structure, and ongoing advances in technology, the 46th Test Wing at Eglin Air Force Base, Florida could ill afford **not** to embrace Total Quality (TQ) as the way of doing business. It gives us the tools to focus on our customer needs, develop a strategic planning approach, and empower the members of our work force to seek continuous improvement. But actual implementation of these TQ tenants is no easy thing. Within the Test Wing we have concentrated on using Metrics as the tool -- our metrics provide us customer focus, strategic planning, and employee empowerment.

Conceptually, our metric system is shown in Figure 1. In its simplest form the metric system consists of two functional elements: First a communication link tying customer requirements to the shop-floor processes, and secondly, a feedback or regulating link tying customer perception to changes made at the shop-level. The communications link is illustrated at

the top of Figure 1, beginning with the customer requirements, then translating those requirements into quantifiable measurands called "Quality Characteristics" that are "rolled down" to the shop-level, where empowered employees use classic TQ tools (Statistical Process Control, Pareto identification, benchmarking, etc.) to satisfy the customers' requirements. Directly under the communications link is our regulating or feedback loop, labeled "Customer Feedback". This feedback loop is used to measure the customers' perceptions of our efforts to meet their requirements. In engineering terms this feedback process makes our entire metric system a closed loop or



self-regulating system. Using this entire conceptual system, as shown in Figure 1, keeps us constantly aware of the requirements and perceptions of the customer as they relate to our process management efforts.

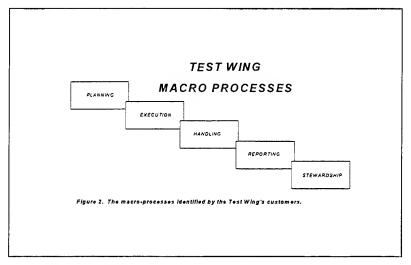
Below, we provide a more detailed description of our metric system and more importantly, its benefits. However, the basic function of our metric system within our total TQ implementation cannot be overemphasized. This metric system is the primary tool which provides continuing customer focus, strategic planning/implementation, and employee empowerment.

Customer Requirements

The whole metric system (as well as our entire TQ program) begins, revolves around, and ends with the customer. Without an in-depth and detailed understanding of the customer, it would be impossible to develop a functional metric system. How did we do it? Initially our wing conducted face-to-face customer visits to identify the key macro-processes important to our customers. In aggregate our customers identified five macro-processes: Test Planning, Test

Execution, Data Handling, Reporting, and Stewardship (Cost Accounting) (Figure 2).

However, even with these five Macro-Processes identified, we found the customers were unable to provide precise measurands within the macro-processes that the Wing could use to measure our process performance. In other words, they couldn't tell us how to measure (or improve) our process. For example, within the test execution macro-process customers told us



their biggest concern was the efficient execution of their test missions; more specifically, the time and effort seemed excessive between asking for a test and finally getting valid data on a mission. The Test Wing knew what the customer wanted but it was nothing leadership or the workforce could manage.

Quality Characteristics

It was leadership's responsibility, as the only group with a detailed understanding of how we do business and what the customer required, to turn the customers' narrative requirements into something measurable and therefore manageable. To accomplish this, leadership had to answer two questions. First, "What measures of performance or results will describe the customers' requirements?", and secondly, "What level of performance or results will satisfy the customers' expectations?" (This second question is a separate issue outside the scope of this article.) Test Wing leadership had to convert customers' requirements into our language -- Quality Characteristics (QCs), or measurands of product attributes that correspond to customer requirements. Using the previous Test Execution example, once our customer identified that going from requesting a mission to obtaining valid data was difficult, it then became the Test

Wing leadership's job to translate that requirement into a QC. Getting missions accomplished correlated directly to "Did the customer's test get on the schedule?" and then, "Did the scheduled test get conducted?" and finally "Did the conducted test get adequate data?". Translating these

questions into a QC resulted in a measurand of the percentage of requested missions which resulted in adequate data. This measurand was then further divided into three QCs; as an example the second question provided the QC of "Conducted vs. Scheduled", or the percentage of scheduled

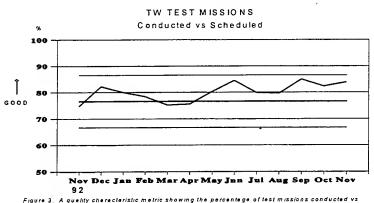
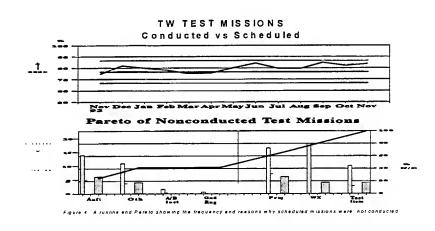


Figure 3. A quelity cherecteristic metric showing the percentege scheduled for the letest 13 month spen.

missions which were conducted. The metric measuring this Quality Characteristic is shown in Figure 3. The thick horizontal line indicates the monthly average percentage of "Conducted vs. Scheduled" missions based on the last two Fiscal Years. The horizontal lines above and below the average line are the three sigma control limits. So now we have something we could begin to manage -- a measurand that gives us a customer focus. However, we still did not know how to improve the QC, and in this format, it was not usable by our shop-level employees. We needed a tool that enabled us to improve the QC and detailed enough to be used at the shop-level. This tool is known as a Pareto.

Pareto Rolldown

Paretos are a statistical method of identifying reasons why a Quality Characteristic is not perfect; they help us to view major cause-and-effect issues. Each of our Quality Characteristics has at least two Paretos associated with it. For example, the Pareto of the "Conducted vs."



Scheduled" QC illustrates the causes (and their occurrence frequency) for scheduled missions not being conducted (Figure 4). The solid bars in the Pareto show the occurrence frequency for the items that caused nonconducted test missions from the past measurement period. The hollow bars show the average and three sigma upper/lower control limits based on the last two Fiscal Years for each Pareto reason. Items to the left of the dotted vertical line are within the Test Wing's control; items to the right are outside of the Test Wing's control. The Pareto provides wing leadership with a priority in applying corporate resources to attain improvement in a QC

(i.e., working the farthest item to the left in the Pareto, since this is the most frequent cause for nonconducted missions.)

But we need to go further. The information available is still wing-level material. There are no shop-level process measurands among the pareto elements. The shop-level process owners still cannot use this information in its current state to manage their processes. We need to get this information, with specificity, to the shops. The technique for getting this information to the shop-floor is one of sub-Paretoing the individual Pareto elements and continuing this effort until shop-floor process measurands are finally identified as Pareto elements. In Figure 5 the Aircraft Pareto element of "Conducted vs. Scheduled" (upper left pair) is displayed over time in the chart "Nonconducted Due to Aircraft Reasons" (lower left pair). This includes a runline showing the monthly percentage of missions not being conducted for Aircraft reasons during the past 13 months, along with a sub-pareto showing maintenance and supply being the causes for Nonconducted missions due to Aircraft problems. Continuing our Pareto rolldown, the maintenance reasons for aircraft problems are broken down to the types of aircraft the Wing uses in conducting test missions (upper right pair). But, we are still not at the shop-level. So, each aircraft type is broken down into its maintenance shop-level components. Taking the F-15 as our example, we see the different maintenance shops (Engine/Auxiliary Power Shop, Airframe Shop, etc.) that are responsible for the F-15s not conducting Test Missions (lower right pair). Now we are finally down to the shop-level. Because of this Pareto rolldown, the shop personnel have a demonstrable and direct link tying a measurand in their shop (cancellations due to F-15 engines) to the performance of a wing level QC, which in turn links their efforts to the customers' requirements.

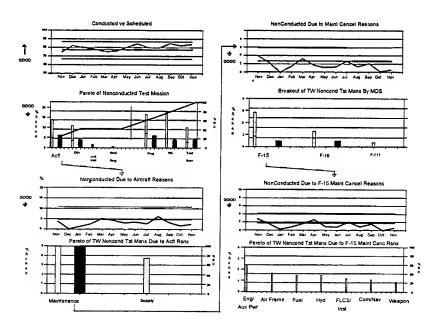


Figure 4

Process Characteristics

Paretos and sub-paretos allow us to relate customers' key Quality Characteristics of macro-processes to shop-level processes. This in turn permits process owners (shop-floor employees) to manage and improve with a direct customer focus --

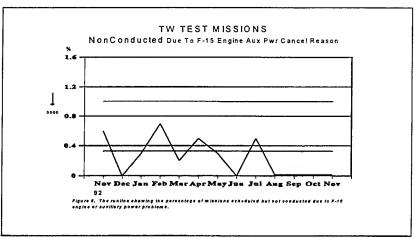
empowerment! With an understanding of the Pareto rolldown, it is easy to see that Process Characteristics (the bottom of a Pareto rolldown) are the actual drivers of Quality Characteristics.

Managing the Process Characteristics is the responsibility of the shop-floor level personnel -- the process owners!

Our shops use standard Statistical Process Control tools to: identify meaningful trends or shifts in average performance; identify and continuously improve causal factors; and manage to our customers' needs. In our example, after rolling down with the Pareto and sub-paretos from "Conducted vs. Scheduled" to the F-15 engine shop (the biggest single sub-pareto item contributing to non-conducted missions), the engine shop deduced that their primary Pareto area was the auxiliary power system for the F-15 engines. The shop set out to solve this recurring problem. They reviewed all their internal maintenance practices and training procedures. They then went to other units to benchmark how others maintained F-15 auxiliary power units. They came to the conclusion that the auxiliary power units servicing methods were critical to their proper performance. As a result, they changed their servicing training processes in late June '93 (Figure 6) -- more on this later!

Customer Perceptions

We have discussed how a communication link from the customer to the shop-floor was developed. But the question remains, "How do we know if the customers "perceive" their needs are being satisfied?" In using our previous example, the F-15 engine shop can fix itself to where they're perfect (and they did!), but if the customer is still not pleased, then



we haven't solved the problem -- something is still missing. From an engineering perspective, it's called feedback. By getting customer feedback on a regular basis, we have a metric system that is a closed loop, i.e. it is self-regulating. In other words, we can see if we are indeed doing what the customer expects of us -- we can use feedback as our report card. We also identify any changes to our customers' perceptions and requirements, and respond to those changes.

Customer Feedback

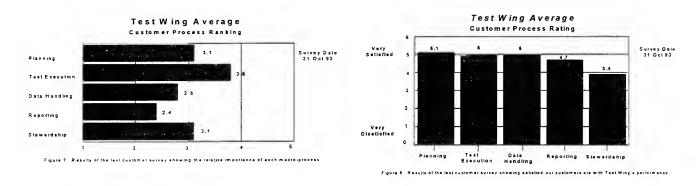
The Wing obtains feedback by semi-annually conducting face-to-face and questionnaire surveys of its customers. We ask our customers to rank by relative importance each macroprocess previously identified, and to rate their satisfaction on how well we accomplished each macro-process using a scale of 1-6 from very dissatisfied to very satisfied.

After collection, the survey data are used by both management and process owners to understand how changes to our macro-processes have affected customer perceptions. Survey data are displayed at wing and squadron levels, as well as the results of specific tests. Therefore, senior leadership can look at the macro level, while a Test Engineer can look at survey results of a specific test.

We aggregate an average for all Test Wing customers and graphically display it. Looking at the Customer Process Ranking aggregate chart (Figure 7), the Test Wing can identify which macro-process is most important to our customer, i.e. Test Execution with a ranking of 3.8. This information is valuable but we also need to know how well we are satisfying the customers'

needs. Once again an aggregate value for each macro-process is obtained from the customer surveys and graphically displayed as shown in a Customer Process Rating chart (Figure 8).

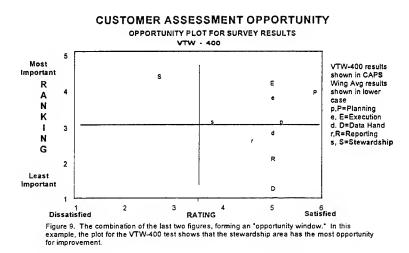
While aggregate wing level rankings and ratings are valuable, a classic "Opportunity



Window" display of individual test

results (Figure 9) is also an effective tool for deciding where to focus resources to correct trends or deficiencies for a particular test. The most obvious area needing work would be those items where a customer has determined a RANKING of Most Important, but a RATING of Least Satisfied. This is found by looking at the upper-left hand corner of Figure 9. That's the target to work on first. From this we can then determine which areas we should focus on to most improve our customers' perceptions.

As is seen in Figure 9, this customer identified
Stewardship -- S -- as the most important macro-process for their individual test (see left scale). It is also the macro process for which this customer is least satisfied (see bottom scale). This becomes the Test Wing's target of opportunity to satisfy this customer. The "Opportunity Window" also displays the Wing average for all tests,



shown in lower case letters, which allows the Test Engineer or shop-level worker to compare their test results with the rest of the Wing. From this information the Test Engineer learns that his/her customer sees Stewardship as very important, yet we have failed to meet their expectations.

This in effect closes the loop. This feedback system allows us continually react to changes in customer perceptions by allowing the process owners at the shop level to improve in the areas the customer deems (through surveys) most important.

Metric System Summary

We've now taken you through the entire Test Wing metric concept. Starting with the customer requirements, such as efficient completion of requested tests, using metrics as the communication link, rolling down customer requirements to the shop-level so the process owners can manage to satisfy the customer. The feedback system keeps us abreast of customers' changing perceptions, so we can react to these changes, making the entire metrics system a closed loop process. As shown in Figure 3, we have improved our percentage of "Conducted vs. Scheduled" missions dramatically over the past year, helping to satisfy the customers' initial requirement discussed above. The entire metric concept has led to many positive and dramatic results.

Results

We've mentioned empowerment -- what are the results of that concept? For example, before the metric system, people working in the F-15 engine shop had difficulty seeing how their actions affected the overall Test Execution process. However, with the metric system in-place,

i.e. a communication link from shop-floor to macroprocess QC to customer, there is an understanding that the Test Execution QC was the end result of a specific F-15 engine shop process.

This was in fact what happened in our F-15 engine shop. Since they began their process improvements in July '93, there has not been a single F-15 test mission canceled due to engines or auxiliary power. The dramatic results are shown in Figure 10.

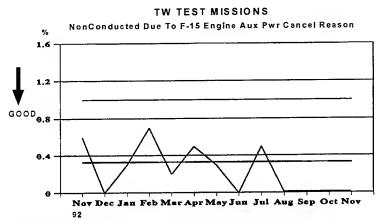
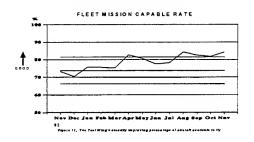


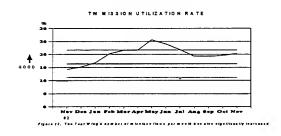
Figure 10. The impressive results of the F-15 engine shop's process improvements, begun in July 1993, are dramatic--no cancellation since last week in July!

The collective efforts of multiple shop improvement initiatives like the F-15 engine shop, have substantially improved our ability to conduct scheduled missions, i.e. the results shown in aggregate in Figure 3. The metric system, as a tool for communicating customer requirements to the shop-floor has allowed us to do this in a disciplined, methodical fashion. It also has freed up wing leadership to decrease our daily management of test execution and begin focusing on strategic planning.

We have had considerable broad based success because of shop-floor efforts and the empowerment of the shop-floor workers. We reduced by 33% the number of aircraft needed to conduct our test missions, resulting in tremendous cost savings. Because of shop-level initiatives, we have also realized 30% cost reductions by improving shop-floor repair of aircraft parts. Also, shop chiefs in charge of our test range systems are beginning to use metrics to cut range costs.

How did we reduce our test fleet size while maintaining total flying output? By using rolldown metrics, our shops have continually made improvements like the F-15 engine shop. The result has been a steadily improving Mission Capable Rate (percentage of aircraft available to fly), currently the highest in Test Wing history (Figure 11). Because the aircraft are available to fly missions, this has allowed us over the past two years to double our Utilization Rate -- the average number of missions flown per month per aircraft (Figure 12). This in turn allows us to

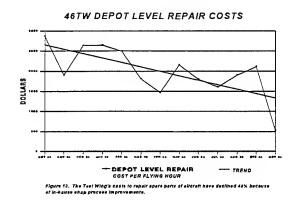




use fewer aircraft, permitting a downsizing of our aircraft fleet by 33%. This downsizing, in turn, has resulted in a savings of 270 manpower slots with a total annual savings of \$5.8 million -

- 10% of our military manpower budget. These efforts allowed us to produce the same number of missions while using fewer resources, enabling us to give the customer a product at less cost.

In the same spirit of empowerment, the shops doing repair work on aircraft avionics have reduced the cost of depot repairs. Analyzing problem areas revealed by their metric Paretos, allowed shops to establish programs to make



our own in-house repair capabilities more efficient. This has resulted in an overall 48% cost reduction during the past year (see figure 13).

Recently we have developed a similar set of metrics to monitor our test range facilities costs. Our metrics roll down to each range system and measure the utilization and total cost to run each system. The shop chiefs are now becoming involved in cutting range cost using these metrics.

We have been able to incorporate our metrics approach into our strategic planning, and we are beginning to see new and even more valuable gains while staying focused on the customers' priorities. Test Execution has been our main focus because it is what has been most important to our customers. But over time with changing conditions, our customers have reevaluated their needs and priorities. This reevaluation has revealed that Stewardship is now rapidly increasing in importance. With this shift in our customers' priorities, the Test Wing is also turning its focus toward Stewardship, and beginning (in advance) to apply our corporate resources to working this issue. That's strategic planning! Consequently, if we can use our metrics in our strategic

planning, then we can keep our customer focus and even let our shop chiefs work the strategic plan!

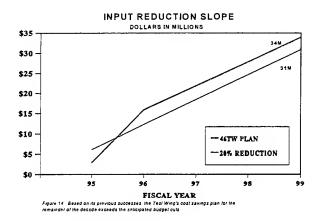
The Future

In our strategic planning sessions, we have accepted as a challenge the requirement to reduce input resources 20% before the end of the decade. The result of this reduction could either be a down scope of our mission, or find an alternative to maintain output with diminishing resources (and reduce costs to our customers!). Our approach to this problem will be based on the lessons learned from our past successes with our metrics system.

So, with the results just discussed and the lessons learned, the question is: How do we plan to perform our test mission at the same level with a 20% budget cut? Is there a major resource cost driver that isn't yet being closely managed, and could quickly be turned over to the shop chiefs? Our answer: Manpower -- and this is our main cost driver. There is a lack of knowledge, tools, and incentive to deal with this area. Motivated by our successes in the past, we know that metrics can give the knowledge (communication link), incentive (empowerment), and priorities (Paretos) for the shop

chiefs to manage their own manpower costs.

We plan to do this by measuring total manpower costs, (military, civilian, and contractor costs), and measure principle mission related products in each shop. From these data, a rolldown to a shop-level metric can be established using manpower cost per unit output. Using these newly developed tools, we will empower



our shop chiefs to control manpower costs. In this manner, we expect to exceed the savings of 20% well before the end of the decade (Figure 14).

Conclusion

In summary, our previous cost reduction efforts when guided by metrics and worked by empowered shop chiefs, have consistently yielded 20-30% savings, without decreasing output. The Total Quality philosophy is alive and well in the Test Wing. As a result of this philosophy, we have employee empowerment working for us. Employee empowerment means allowing the employee at the lowest level to take charge of his or her job function, determine what changes need to be made to improve upon present performance, and make those changes -- all for the benefit of our customer. We have also learned to incorporate our everyday customer-focused shop-level metrics into our strategic planning.

There have been many other improvements because of our Total Quality philosophy. A few examples are:

- A team was chartered to improve on our scheduling and use of airspace. They devised a new process enabling more missions to be scheduled in the same airspace -- resulting in a 50% decrease in missions being non-scheduled due to airspace conflicts.

- A squadron-level team developed a Pareto to determine the cause of late delivery of trailers to their designated location. The results -- over 90% of their trailers arrive on time, up from only 12%.
- Test Wing personnel wanted a program that would allow them to improve their physical fitness during duty hours. The result -- a fitness program during duty hours without mission impact. Two additional benefits -- our weight management totals are down 30%, and the Test Wing pass rate for the Air Force fitness test has increased by 70%.
- We are even looking at areas that were originally thought to be out of our control. We formed a team to look at the weather effecting mission productivity. The end result of their study is enabling more missions to be conducted on bad weather days, as well as fewer missions canceled for weather, with less overall cost to the customer.

Test Wing leadership is involved, committed, and dedicated to the TQ metric system techniques used to track customer needs. By continually focusing on customer requirements using a closed loop feedback system, we are able to develop and update our strategic plan based on these customer requirements. This allows us to empower our employees down to the shop level, enabling them to improve their processes and successfully meet the ever-changing requirements of our customers.

PART II

The Advanced Workplace in the Year 2000

Advanced Teamwork for the Learning Organization



Mr. Kenneth C. Blackman

Kenneth C. Blackman is the president of Creative Leadership R.S.I. He is a communication consultant for business and government. He teaches skills for improving team work and seminars on expanding personal power. His background includes eleven years as a United States Air Force officer. He has presented workshops all over the United States. He is a Master Practitioner of Neuro-Linguistic Programming and received a B.S. in Physics from Valdosta State University.

Advanced Teamwork for the Learning Organization

Kenneth C. Blackman

Creative Leadership R.S.I.

ABSTRACT

The cornerstones for the learning organization are aligned teams. These effective teams are built with **commitment** and laid on a foundation of a shared vision. They are flexible, creative, and act coherently. Aligned teams are carefully developed over time with clear guidance, proper training, and above all enrollment into a state of commitment. There are five postulates that guide the way for understanding how to create committed teams.

- 1. When attempting to enroll people, it is of the utmost importance that you attempt to communicate with them in their thought patterns.
 - 2. The commitment must be meaningful to the person being enrolled.
 - 3. It is important to be clear about the extent of the commitment and the evidence for proper performance.
 - 4. Commitment is not a static thing, it changes with time.
 - 5. In an aligned team, commitment is shared among its members.

Along with these postulates is a useful concept that helps provide the proper frame of mind for creating a committed team. The concept is:

Most team members WANT to be in the state of commitment, if they aren't, then something is stopping them. Using this concept team members are invited to get rid of limiting beliefs and eliminate barriers to success. Creating an environment for an aligned team is a complex task. It's both art and science. In a learning organization "enrollment is a natural process." When the vision is presented there is a state of congruence, "all systems are go," - commitment is sure to follow.

Only a few groups, teams, or organizations have the profound type of commitment that can be found in the US military. Every day when the men and women of the US military put on the uniforms of their respective services, they put on the symbols that represent exemplary duty, intense pride and profound honor to their country. Repeatedly acts of heroism and dedication attest to their true commitment. This commitment is a *precursor* to an excellent team process that gets results. Yet, not every military team possesses the same level of commitment. This paper addresses the elements of creating commitment in a learning organization.

"Learning organizations are organizations that continually expand their capacity to create [and shape] their future" (Senge, 14). The cornerstones for the learning organization are aligned teams. These effective teams are built with commitment and laid on a foundation of a shared vision. They are flexible, creative, and act coherently.

Quick, accurate responses are needed by *aligned teams* in this dynamic world environment. Current tools for team building rely on brainstorming, Quality Function Deployment, story boarding or some kind of analytical tool. These are great for development of work processes or training. However, the tasks that face most CEOs or field commanders happen much too fast to respond to using these time- consuming methods. The type of teamwork that rises to the occasion is the kind that is carefully developed over time with clear guidance, proper training, and above all enrollment into a state of commitment.

Peter Senge states that "Enrollment is, in [Charles] Kiefer's words, the process of becoming part of something by choice " (218). Senge describes being "committed"...as "a state of being not only enrolled but feeling fully responsible for making the vision happen" (218). Senge goes on to say:

In most contemporary organizations, there are relatively few people enrolled - and even fewer committed. The great majority of people are in a state of "compliance." "Compliant" followers go along with a vision. They do what is expected of them...they are not truly enrolled or committed (219).

It's easy to talk about the benefits of an *aligned team* that is committed to the task at hand and it's another thing to actually generate this type of commitment. What does it take? How do you generate commitment in an *aligned team* especially when the team environment had not been conducive to one before?

To begin, let's come to an understanding of what commitment is. Since it is a state of being of a particular person, it is very much dependent on that person's thought processes. Each of us has a set of thought patterns that are unique to us in one sense and are common to humans in another. These patterns generate or trigger emotions like happiness, sadness, fear, and anger (Dilts et al.119-122). Among these emotions is a sense of commitment. When we are committed, we are compelled to certain behaviors that show the extent of our commitment. But commitment is not

an emotion alone. It is a series of thought processes that are held as representations in our mind and shared by language (both verbal and nonverbal) with others in the culture (Hall). In short, you cannot expect to easily find someone else with an identical set of thoughts and emotions about commitment. However, enough similarities can be found that allow us to express ideas and elicit emotions and behaviors in others (Hall).

Along with a discussion on thought patterns we must examine the directions these patterns take. Ask the question, To what end are these thoughts and subsequent emotions of commitment directed? Generally, thoughts and emotions either 1) avoid pain and/or 2) move toward pleasure (Bailey). In other words, a person commits for a reason - to satisfy some need. This reason can either be in the person's conscious awareness or out of conscious awareness (Hall). It is possible to be committed to a belief and not know why.

Consider the following postulates:

1. When attempting to enroll people, it is of the utmost importance that you attempt to communicate with them in *their* thought patterns.

The reason for this is simple. If your language does not reflect their thought patterns, they will not understand you. It's not enough to transmit the idea, you must elicit the emotion too. Remember, commitment is both thought pattern and emotion. Very few people will get excited about something they don't understand. They can, at most, support the idea and comply with your wishes.

2. The commitment must be meaningful to the person being enrolled.

How often are people asked to commit to something that only a one person considers important, namely the person doing the asking. If people don't understand how being enrolled is of benefit to them, their organization, or their country, they will not easily commit. Also if what is being proposed, they believe, is **against** their interest they may be **committed to opposing** the idea.

3. It is important to be clear about the extent of the commitment and the evidence for proper performance.

You can expect each person to make unique representations of what commitment is. It comes as quite a jolt to a team when in the middle of the action they discover there are significant differences in the levels of commitment among the team members. Here the team was not clear about what everyone's commitment was. The clearer participants can be initially about what is expected, the less conflict that will arise later. A great vehicle for this discovery is in training that simulates the expected action and stimulates the desired behaviors. This training is good because it exposes commitment that is out of conscious awareness. Training participants may be surprised at their own responses to the stresses of training and what their level of commitment really is.

4. Commitment is not a static thing, it changes with time.

People will become more committed or less committed depending on how their needs are satisfied and how they create expectations of possible (future) benefits. For example, at the start of a project a team member evaluates the expected benefits and risks of his or her participation in the project. This evaluation, in part, determines the person's level of involvement (commitment, compliance or apathy). As the project goes on, the person usually continues to re-evaluate the benefits and risks in light of their experience. This re-evaluation can change the person's level of involvement. It's important to note that culture and subconscious mind processes have a profound effect here (Bolman and Deal). It is difficult to exactly predict if a person will be more or less committed or just stay the same. You can expect, however, that a certain amount of resources such as time, interest, your personal commitment, etc., will be needed to maintain or renew the commitment of the team members.

5. In an aligned team, commitment is shared among its members.

When team members make commitments, they begin to generate expectations in their teammates minds. These expectations are beliefs about how a person will behave in a given situation and what benefits can be derived or detriments result from their behavior. Behaviors of one person can influence the commitment of others. For example, imagine a team member looking over and hearing another team member successfully overcoming a difficult situation. The observing team member may be inspired to a deeper sense of commitment. In this case, attitudes like "we are all in it together" and "I couldn't let them down" become prevalent. The desired result, an *aligned team*, is reflected in an interwoven set of commitments. On the other hand, if a team member fails to demonstrate fairly consistent commitment, other team members may become somewhat less than enthusiastic about having that person on the team. In the worst case other team members question their own participation on the team and lose their commitment. Compliance and apathy on the part of a few may breed mediocrity for the whole team.

The five postulates noted above can serve as guides to building committed teams. To complete the picture the following concept is useful in getting the level of commitment you want:

Most team members WANT to be in the state of commitment, if they aren't, then something is stopping them. Using this concept allows you to invite team members to get rid of limiting beliefs and eliminate barriers so they can get what they want - the state of commitment. Understand that not everyone will accept the invitation at first. If you have nothing to offer a person for their enrollment, what reason do they have to enroll? Implementing

this concept often requires patience, time, energy, and generally hard work (unless you have a very good strategy). You must continually get and keep people enrolled to accomplish.

The opposite point of view is: most people don't want to be in a state of commitment.

Look at how few people achieve that state. A person that uses this negative concept will be forced to push people into commitment any way they can. They use dictates, leverage, coercion, and nine-step team building programs. None of these usually get the results they are after, do they? These methods yield compliance at best and apathy on the average. Their advantage is they don't take much time or energy to implement - at first.

Creating an environment for an *aligned team* is complex and there are many more issues than this paper would suggest. Getting to commitment is both an art and science. Too often we hear leaders say, "we will commit ourselves to this new management program, by orders of our commander." In the meantime, subordinate commanders sell their troops, exhort and even, it is sad to say, extort those in their command to repeating the required words and show the required behaviors to comply. Often the original intent of the program is long lost in the negative influences created by "pushing" a program. Yet, fact is, the program **must** show "success" within a fiscal year or tour of duty or promotion cycle - and it always does, even at the expense of the commitment and integrity of most honorable troops. Finally, with the original intent of the program distorted it is often replaced with the objective of survival at various levels.

On the other hand, in a learning organization "enrollment is a natural process." When the vision is presented there is a state of congruence, "all systems are go," - commitment is sure to follow. Remember the people can't be pushed into commitment, they must be invited. As indicated earlier, one way to enroll a person is to find out how they structure their thoughts then present the vision in **their** language.

For the United States Air Force to shape its future through a learning organization it is imperative to explore the ideas of commitment, systems thinking, and innovative thinking. For team work it may just mean re-discovering the *aligned teams* that already exist and transporting their magic and commitment to other teams in need.

I hope this paper has played a positive role in ensuring the United States Air Force continues to be the

"...worlds' most respected air and space force."

References

- Bailey, Rodger. <u>Language and Behavior Profile</u>.

 New York: The Language and Behavior Institute.

 1987.
- Bolman, Lee G. and Deal, Terrance E. <u>Reframing</u>

 <u>Organizations</u>: <u>Artistry, Choice and Leadership</u>.

 San Francisco: Jossey-Bass Publishers, 1991.
- Dilts, Robert et al. Neuro-Linguistic Programming:

 Vol. I, The Study of the Structure of Subjective

 Experience. Cupertino, CA: Meta Publications,
 1980.
- Hall, Edward. <u>Beyond Culture</u>. New York: Anchor Books, 1976.

Air Force Teams for the Year 2000



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AIR FORCE TEAMS FOR YEAR 2000 CHAPLAIN, LT COL, J. RICK WILSON HQ ACC/HC, LANGLEY AFB, VA

ABSTRACT

The purpose of this paper is to offer some ways of thinking about building effective Air Force teams. It is written within the context of Air Combat Command's "Quest for Quality," where personnel are being told they must make a transition to a new quality culture. Some interpret this to mean that much of the old must be left behind. Instead of leaving one culture and moving to another, the presupposition of this author is that the Air Force is multi-cultured. The change the Air Force presently faces is the addition of a new cultural outlook (cosmopolitan) that calls for decision making by teams. The author's view is that insight can be gained in building effective teams by examining social constructionism (a recent development within the study of family/human systems theory) with special attention paid to Gregory Bateson's cybernetics theory. The paper states that there is considerable evidence that some Air Force leaders and personnel are not team oriented and are resisting the new culture addition. The paper offers eleven postulates for better team building. The author recommends that the Air Force provide effective team building training based on understanding culture change, team communication, team dysfunctional behavior and team relationships.

INTRODUCTION

An Indian fable tells about a maharajah who blindfolded several of his loyal subjects, placed them at various points around an elephant, and told them to describe what was in front of them. Servant #1 felt the elephant's side and said he perceived a wall. Servant #2, holding a tail, said it seemed to be a rope. Servant #3, at the trunk, said he held a water hose. Servant #4, grasping the tusk, said he believed the object was a spear or horn. This story produces a humorous and possibly chaotic image of the reality created by different perspectives.

Currently, the Air Force as an organization is expanding its use of teams. For example, Air Combat Command strives for a leadership style that creates a working climate that promotes trust, team work, and continuous improvement (Air Combat Command 1993 Stakeholder's Report, p5). An integral part of creating and perpetuating this style is building effective teams. The overall organization is asked to see itself as a team working toward shared goals and objectives in order to accomplish a common mission. Not only does the organization work underneath the umbrella of "team", but the organization consists of many smaller teams. The many smaller teams contribute to the overall team concept, or team system.

The Air Force historically has perpetuated the idea of team work and prided itself as a highly successful team. It is not unusual to hear a wing or base referred to as "Team Nellis" or "Team Minot." Yet, the Air Force structure is obviously hierarchical and in some ways it can be difficult to understand a military organization as a team. Therefore, the cultural shift, spurred by its quest for quality improvement, is not readily accepted by all of its members.

The 1993 Air Combat Command Quality Survey indicated "real progress toward creating a new culture of trust, teamwork, and continuous improvement, where no one is more or less important

than anyone else" (Air Combat Command 1993 Stakeholders' Report, p10). It is important to define the concept of "Air Combat Command teams" within the context of a community that is changing its culture. This culture, its norms and forms of communication have much to say about these teams.

Some believe that communication is the primary cultural or social process. Dr. Barnett Pearce, chairperson of the Department of Communication Studies at the University of Massachusetts, states that there are different forms of communication that have been used through humankind's existence: monocultural, ethnocentric, modernistic, neotraditional, and cosmopolitan (Pearce, 1989, p93).

The traditional Air Force culture, with its codes of military ethics and etiquette, is congruent with ethnocentric communication. Also, it possesses elements of the monocultural style where "I listen to what they say and I know what they mean." In many ways, the Air Force is known as a technological culture. During the eighties, the Air Force moved with force within the modernistic culture where technology promised answers to complex problems. For the modernists, truth exists out there and science will find it.

In the 1990's, Air Combat Command calls for its personnel to move into a new culture where differences, creativity and dialog flourish. Dr. Pearce cites three conditions for the impetus toward cosmopolitan communication: democratization, the communication revolution, and disillusionment with modernity (Pearce, 1989, p169). Air Combat Command has recognized that all the answers to keeping America free are not to be found with technology (disillusionment with modernity). It also sees a world where communication is changing rapidly (communication revolution) and teams can dialog and create continuous improvement, where "no one is more or less important than anyone else (democratization)."

Air Combat Command's cultural transition is dramatic and unsettling. Some see dangers and possibilities in making this transition and remind us that the new culture may not have any better answers than the old. It is difficult to think that one's sense of reality is wrong or in need of adjustment. Therefore, the increased use of teams may or may not be problematic as people are exposed to different perspectives of changing reality. The belief of this author is that the new, sometimes bumpy, road to a cosmopolitan culture must be traveled because without this transition the Air Force will become obsolete or ineffective. The new road will have shady spots where one can revisit the past but the travelers will all take part in the journey that requires trust, team work and continuous improvement.

How does an organization build more effective teams? Specifically, how does the Air Force build more effective teams? The following pages, which suggest possible approaches for building effective teams, are based on related learning about human relationships from social constructionism (a part of family/human systems theory) and anthropologist Gregory Bateson's work with cybernetics. For the purposes of this paper, a team is defined as two or more people with a shared objective requiring interaction and coordination of effort.

Case Study

The team consisted of seven members, 4 females and 3 males. The team leader was civilian; the remainder were military. All seven personnel had experienced success as individuals and team members prior to this assignment. The team worked on an Air Force facility with approximately 5000 military personnel assigned with a total population of 11,500 people. The team's mission was highly visible and produced extreme stress among the team members.

The team leader (director), who had just resigned, called and asked me to consult with the team, the new transitional leader and herself. She said that the team members were hostile towards one another, her and the commander. Some felt betrayed and were considering resigning from the Air Force. She told me that the commander was considering firing two of the team members. She hoped to bring the team together before she left to take her new position. She stated that she resigned because of the stress from the job. The newly appointed transitional leader also called and said he thought the meeting would be a good idea. He informed me that the commander had told him the team members were not doing the job and probably needed replacing. The commander said, "You clean the mess up and the permanent director's job is yours." The new leader went on to tell me that he was a seasoned supervisor and he knew what the team needed. I asked him to explain what they needed and he said, "a heavy hand."

The team and I planned to meet for three days. The first day, the team worked on team building using the Myers Briggs Type Indicator (MBTI). We discussed how the instrument has proven to be helpful in assisting people understand that human personalities can be characterized by 16 different types or preferences. In 1920 Carl Jung said that people are different in fundamental ways even though they all have the same multitude of instincts to drive them from within. One type is no more important than another. What is significant is our preference for how we function. Our preference for a given function is characteristic, and so we may be "typed" by this preference.

Even though the MBTI is useful in understanding people and building teams, I cautioned the team, and myself, against labeling people certain types. Many want quick answers to explaining human behavior and building better teams. The MBTI can explain some but not all human behavior and can heighten team awareness of issues like communication, change or leadership. The team experienced the greatest benefit in using the MBTI in team building through the opportunity it provided for dialog and creating new realities for relating and working.

While working within organizations some research indicates that some individuals agree with all four letters of their reported types 65 percent of the time (Kummerow, p20-25). Kummerow also found that using the MBTI, introverted types are more likely to report extroversion; that there is little difference between sensing and intuitive types; that feeling types are more likely to report thinking; and that perceiving types are more likely to report judging. Other studies report that agreement is 85 percent (Hammer & Yeakely, 1987, pp52-55), and 78 percent (Anchors, Robbins, and Gershman,1989, pp20-25). These data may indicate that people who take the MBTI in organizations sometimes answer the MBTI questions in a way that is acceptable to management.

At the end of the first day, the team members were less angry. They were talking to one another again and indicated they wanted to continue team building the second day. On the second day, the resigning leader and all the team members except the new leader reported to the class. The group decided to continue without him. He called later and said the commander had required his presence and for us to proceed with the class. He said he felt he really didn't need to be with us, anyway.

The second and third days went well considering the new leader failed to show. At the end of the three days the team was on the way to rebuilding their trust for one another as they had a new appreciation for different team skills, ways of perceiving and decision making. They gained a new appreciation for the value of teamwork Vs the work of unconnected individuals. They began to understand that the context of their difficulties was within a changing Air Force system. As they returned to the office the next day, they were ready to put their new communication skills to work and to leave behind their previous dysfunctional behavior.

One week after the team building exercise the NCOIC of the team called and said the new leader told the team at their first staff meeting that the team was not doing the job and therefore, all decisions would come through him. He took away all supervisory roles of the more senior people, set tight rules and said that if things didn't change for the better in the next few weeks he would fire those who were not cooperating.

The team became more paranoid and within six months three team members left the Air Force and the leader was fired. The Air Force lost highly skilled people and customers' needs were not met during the period of turmoil. Presently, only two of the original team members remain and a new team is forming.

This case study took place when the Air Force was undergoing significant change. Resizing, early retirement, increased deployments, readiness emphasis, and decreased funding, all played a part. The larger system/team's changing impacted the smaller system/team. Of course, the reciprocal is also true.

Possibly the major contributing factor to the failure of this team might have been the belief by the new leader that one person possessed all the truth for the correction of the problems that the team faced. The leader was in a bind because of the message he was getting from the system that a good leader can turn the right key that will open the door to effective team operation. He felt he had to come up with an answer. The team was being told by Air Force leadership that everyone has something to contribute that is important and worthwhile. Yet, they felt unimportant and more of a liability than an asset to the Air Force. The team lost all trust in the larger and smaller system.

The experience of working with this team created many new ways of working with future teams. Follow-up conversations with several of the team members indicated that they benefited from the process as they prepared to work with other teams. Possibly, this is what happens at the lower levels of a culture as it goes through major transition. It may be inevitable that individuals

experience stress and conflict that actually bring about the change. Nonetheless, it seems that the Air Force can ill afford such misuse of resources if the dilemma can be avoided.

Social Constructionism (Family/Human Systems Theory)

The Air Force's most prized asset is its people. People come from family systems and in many ways Air Force personnel behave and relate like families. The following systems theory postulates can be helpful when working with teams.

Postulate 1- A team is a system and if you change one part of the system you change the whole (Freeman, 1981, p20). The team as a whole is greater than the sum of its parts. Teams need to look at the system as a whole and not just at the parts. The entire Air Force system is changing. If teams fail to see the whole system, proposed changes may bring more problems than solutions. Watzlawick gives an interesting illustration of this problem creating phenomenon. He writes about the US Space Agency building a massive hangar to protect its enormous rockets from adverse weather conditions only to find that the hangar was big enough to attract its own micro-climate, complete with clouds, rain and discharges of static electricity (Watzlawick, 1988).

In order for teams to affect change, they must change themselves. Rigid teams..., when under pressure to change, will create projects to promote change with the following results: (1) many of these projects are never carried out and die quiet and unnoticed deaths (2) divisions develop between factions striving to achieve recognition of and backing for their own particular projects (3) the appearance of symptoms in some staff members (Palazzoli, 1984, p301).

The Air Force team is a designed system but it is also a socially constructed system; it is socially dynamic and changing. Team members participate in constructing the system. As a system it is adjusting to its environment and a balance of flexibility and stability is key. If Air Force leaders refuse to re-engineer or carelessly cut manpower in order to meet some arbitrary externally mandated force structure, the system is at risk.

How will the Air Force look in ten years? The system is under construction. It is being constructed by team members as they dialog about customers, output, processes, input and suppliers. Empowered teams in dialog about change find new possibilities that fit the new environment and extend the life/relevance of the whole system.

Postulate 2- Team behavior has meaning within the context in which it occurs.

When the behavior is examined outside the context it can have a different meaning. For example, the term "bleeding heart" has one meaning in the context of a romantic novel, but it has an entirely different meaning in a hospital emergency room. "Quality Air Force" has one meaning for a team in Air Combat Command and another meaning for a team in Air Education and Training Command. "Each person is as important as the next" means one thing to a young airman on the flight line and something else at the commanders staff meeting.

Postulate 3- The team becomes more complex and organized over time (Freeman, 1981, p21). Rules and relational patterns become rigid and institutionalized. This can be both

positive and negative. Positive if: (1)standards of excellence are set that improve the team and increases each team member's self-esteem, (2)standards are sustained that improve work performance by challenging individuals and the entire team. Conversely, organized and complex dysfunctional behavior may become the norm and destroy teams.

Postulate 4- The team is open, changing, goal directive and adaptive (Freeman, 1981, p24). The team has resources to meet needs and has the capacity to adjust to change. Under stress the team can be unaware of these resources and may need a stranger or consultant to come in to facilitate the use of these indigenous resources. Evidence of this is seen by comparing 1991-1993 responses to the Air Combat Command's Satisfaction Survey. The job satisfaction level among ACC personnel made a significant increase. One would think that facing increased deployments, family separations, early retirements, downsizing, etc., that personnel would be less satisfied. Many factors can contribute to these results, but it is possible that the change to a quality culture does cause people to feel more a part of the "ACC Team."

Postulate 5- When the team exhibits dysfunctional behavior, this behavior is reflective of an active emotional system (Freeman, 1981, p27). Team conflict and anxiety do not occur solely because of the personal struggles of one team member. Teams may be said to develop reciprocal patterns of relating which are more or less mutually satisfying. Therefore, the team may exhibit dysfunctional behavior and become "stuck" when facing stress and anxiety.

Postulate 6- Teams are less successful if labeled dysfunctional. Individuals and teams are not dysfunctional. Instead, they behave dysfunctionally. If a team member or the entire team is labeled dysfunctional, creative and break-through thinking is restricted. Some good team members are lost because of negative labeling. For example, labeling middle managers as the group most resistant to implementing quality initiatives is popular, but problematic. Some of them want to participate in the change, but because of the negative labeling, they begin to believe they no longer fit in the Air Force. Yet, many Air Force middle managers are among the best educated on a base and are often the ones calling for change. They certainly have successfully undertaken considerable change over the last 15-20 years. Rather than categorically labeling the middle managers as the most resistant, Air Force leadership might want to ask how this group could be included in the new culture. Surely, they have much to contribute to cultural change.

<u>Postulate 7- Teams relate or interact in three basic modes: symmetrical, complementary and reciprocal</u> (Bateson, 1990, p68).

SYMMETRICAL-Two people exchanging the same behavior may be said to relate in a symmetrical fashion. For example, two team members exchanging compliments or criticisms are regarded as symmetrical. The members are competing for a 'one-up' position. It is not unusual to witness Air Force teams with members who are repeatedly competing for a 'one-up' position, especially, when one perceives that individual success depends upon winning as an individual at the expense of team success. Air Force teams do not compete for promotion, individuals do.

COMPLEMENTARY-Two team members exchanging different behavior in a sequential exchange can be said to be complementary. This relationship is referred to as 'one-up' and 'one-down' positions respectively. A team is in trouble when members become entrenched in a

complementary relationship. When this happens, it is not unusual for one team member to be regarded as the "intelligent" one and have another play the "dumb" team member's role. If this occurs, the team will waste valuable time and energy in a process that will produce limited answers to problems and leave team members frustrated.

RECIPROCAL-Reciprocal relationships enable each team member to have areas where she/he will be regarded as the expert. Disagreements are permitted, even encouraged, and can be contained without irreparable damage to the team's relationship. Failure to relate reciprocally is the most common problem for teams. A team that is unable to relate reciprocally is less likely to adapt to changing circumstances. Reciprocal team action can produce two key characteristics of effective teams: (1)unified commitment which comes about with a balancing of needs of self and needs of the team (2)collaborative climate where trust flourishes.(Larson & La Fasto, 1989, p65)

Postulate 8- Teams can develop triangular or triadic relationships. These triads or triangles emerge when conflict between two people is detoured through a third person. Teams can spend considerable time floundering because two individuals fail to talk out their differences and others repeatedly intervene in a hopeless effort to resolve the conflict.

Postulate 9- Team members work in self-correcting ways (homeostasis) to save the very life of the team. It is the attempt to keep a team in balance to allow the team to function. The sense of balance is maintained on a continuum between two extremes, and can be illustrated by the principle of electrical current, series or parallel connections.

A series relational pattern is evident within a team when one person is angry and other team members automatically counterbalance the angry behavior. It can be compared to Christmas lights in a series electrical connection. When one bulb is bad, all the lights go out.

Series relationships do not grow in togetherness as much as they are stuck in togetherness, in ways that paralyze and maintain dysfunction. (Friedman, 1985, p25). The more fused a relationship is in a series relationship, the more their feelings are predominant. And when feelings are overwhelming, distortion and fantasy can prevail.

A parallel relationship is characterized by team members holding independent connections to the main source of energy and during times of stress they can handle more anxiety. (Friedman, 1985, p26). As team members, they are less anxious about change.

Postulate 10- Teams operate at both first- and second-order cybernetic levels. The American Heritage Dictionary states that the word cybernetics is taken from the Greek word "kubernetes" and has to do with the theory of control processes in electronic, mechanical, and biological systems, especially mathematical analysis of the flow of information in systems. The word originally referred to the person who steered the rudder and controlled a ship. Stated differently, cybernetics is the study of how systems can be regulated by devices that monitor and steer their processes.

A thermostat that controls the temperature of a building is an example of a first-order or simple cybernetic system. The heating and cooling system is connected and when the thermometer reports a drop in temperature the system turns on and brings warm air that raises the temperature to satisfy the thermometer's predetermined range.

As systems, human beings are more complex and can be referred to as second-order cybernetic systems. Human beings can think about themselves as systems, can decide and monitor their own behavior. A human can think about her/his behavior, laugh at the behavior, feel guilt over behavior or decide to change behavior. A basic heating and cooling system is not able to think and decide that one room in the building is using too much heat because it is a later addition with inadequate insulation. The first-order cybernetic system will just keep pumping warm air into the building until the temperature is within the accepted range.

Whether human activity is at the first- or second-cybernetic level, the human condition is that of being inextricably enmeshed in a process whose properties are significantly less complex than human capabilities (Pearce, 1989, p61). Therefore, the first dilemma is that humans have more thoughts than their normal daily processes require. Humans often find that their capacity for quality and quantity thinking exceeds their requirements.

Pearce states a second dilemma:

Whether the communication is first or second-order cybernetics, the problem with humans is that there is no system wide monitoring unit that can detect patterns and direct the system in ways that would overcome problems. There are instead multiple monitors-each person involved in the process, none of which has access to the entire system. As a result, errors about whether the emerging pattern is coordinated occur along with potentially uncoordinated attempts to repair the pattern. Further, these second-order cybernetic monitors may make unpatterned changes in their purposes for the practices in which they are engaged or bring confused, conflicting purposes to it. (Pearce, 1989, p61).

These ideas have greatly impacted the study of systems theory in particular. The key idea is that human beings create the universe that we perceive, not because there is no reality outside of our own minds, but because we select the reality that fits with our beliefs about the world. After the recent showing of Schindler's List, some people continue to voice their belief that the Holocaust never happened. Most people know that the Holocaust did happen and it is evident that others select and edit the reality they see about that horrible event. Views about the environment and the connectedness of the universe as a system differ. Some continue to believe that the resources of the world are infinite. These people select their reality by refusing to look at the evidence.

For a person to change his/her beliefs or perceptions about reality he/she must think what may be the unthinkable. The person must consider that reality is not necessarily as he/she believes it to be. Only then is it possible for the mind to consider radically different ideas and perceptions.

Postulate 11- Team leaders in the new culture do not depend upon their ability to give rewards and punishment; rather they set an example for their followers and use their rhetorical skills to establish a common vision (Barge et al, 1989, 359). The leader that continually dialogs with teams will socially construct new realities for the cultural transition and breakthrough change. This type of leader relies upon her/his ability to create and communicate a compelling vision of what is desired and ... energize and transform subordinates into commitment to make a stronger effort (Bennis, 1983, p65). Staff meetings are significant opportunities for such dialog. Sadly, these meetings are sometimes led by commanders and senior leaders who restrict conversation. Subtle glances toward the commander and veiled comments by senior officers can overshadow quality speeches given by these same leaders. Rank can be intimidating and misused, bringing embarrassment and ridicule for different ways of thinking.

Conclusion

In the previous case study, the team leader demonstrated the difficulty one can face when he/she is unsure about the ways of communicating within a cosmopolitan culture. He had learned different styles of leadership but the system's confusion of facing a major cultural change with shrinking resources made his task too difficult. He was unsure about how to bring about change quickly, while allowing his team to build trust and implement the different team member perspectives for solving complex problems.

Effective teams do not come about by accident. No one should expect to "throw" a team together, give them a charter or mission, and anticipate break-through results. Team and team relationships are too complex for that kind of thinking. Teams can improve trust and can continuously improve the Air Force, but all the members must gather around the elephant, must contribute and be allowed to provide their perspectives for a better Air Force.

However, there is considerable evidence that some Air Force and Air Combat Command personnel are not team oriented and are resisting the new culture. Even some leaders refuse to abandon old habits. There seem to be at least three options for the Air Force leadership.

First, the system can abandon the emphasis on teams and return to a more top-down, strict linear/cause and affect approach to decision making. This option uses the insight, unique experience, skills, position, rank and authority of the leader to arrive at the best decisions. The leader may ask for opinions from others, but the fundamental decision is made by him/her. This option has a positive and negative side. Positively, it will allow people to be more clear about how decisions are made and less people will be put in binds over their roles and expectations. Negatively, it seems that returning to this style is unthinkable in the twenty-first century. The new cosmopolitan world culture, with its shrinking resources, calls for the collective ability of organizations and nations to enable us to solve significant problems.

Secondly, the Air Force can continue on the present "wait and see" approach. It assumes that people (firmly entrenched within an ethnocentric/modernistic culture) will become enthusiastic and effective team members as a part of a new cosmopolitan culture and smoothly transition from one culture to another as required. This approach seems to be the least desirable because it destroys the trust that is so essential to teams. People become disenchanted when teams spend

endless hours on projects and their decisions are not used. Empowerment gives way to the old politics of rank and stovepipe organizations. To continue this approach will surely lead to an abandonment of the cultural change process in the future.

The final option, the most desirable, is to continue the emphasis on team building and the use of teams in decision making. This option requires training for leaders and team members. I recommend the QI office at command and base levels provide personnel with the following systems theory effective team building training: understanding culture change, team communication, team dysfunctional behavior, and team relationships.

References

- 1. "Air Combat Command 1993 Stakeholders' Report", published by HQ ACC, Langley Air Force Base, Virginia.
- 2. Anchors, W. S., Robbins, M. A., & Gershman, E. S., 1989. "The relationship between Jungian type and persistence to graduation among college students". <u>Journal of Psychological Type</u>. 17, 20-25.
- 3. Bateson, Gregory, 1990. Steps To An Ecology Of Mind. New York: Ballantine Books.
- 4. Freeman, David S., 1981. Techniques of Family Therapy. New York: Jason Aronson.
- 5. Hammer, A. L., & Yeakley, F. R. 1987. "The relationship between "true type" and reported type". <u>Journal of Psychological Type</u>. 13, 52-55.
- 6. Kummerow, J. M, 1988. "A methodology for verifying type: Research results". <u>Journal of Psychological Type</u>. 15, 20-25.
- 7. Larson, Carl E., & LaFasto, Frank M. J., 1989. <u>Teamwork: What Must Go Right / What Can Go Wrong</u>. Newbury Park: Sage Publications.
- 8. Pearce, W. B., 1989. <u>Communication and the Human Condition</u>. Carbondale: Southern Illinois Press.
- 9. Watzlawick, P., 1988. <u>Ultra-Solutions</u>. W.W. Norton, New York.
- 10. Palazzoli, Mara S., 1984, "Behind the scenes of the organization". <u>Journal of Family Therapy</u>. 6: 299-307.
- 11. Barge, J.K. et al., 1989. ""An Analysis of Effective and Ineffective Leader Conversation". Management Communication Quarterly. Volume 2 Number 3, 357-386.
- 12. Bennis, B.M., 1983. "Transformative leadership". Harvard University Newsletter. April 7, 65.

Common Barriers to Implementing Total Quality Management in Highly Structured Organizations



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3 daughters who happen to be the brightest and best looking girls you would ever meet.

COMMON BARRIERS TO IMPLEMENTING TOTAL QUALITY MANAGEMENT IN HIGHLY STRUCTURED ORGANIZATIONS

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This paper is an abridged version of that which I have submitted as part of the requirements for a Master's of Science Degree in Administration and Management from St. Michael's College in Colchester, Vermont. As the title implies, this paper addresses common barriers to implementing TQM programs in highly structured organizations. As part of my research for the paper I attempted to determine why these barriers exist and what strategies are being employed to overcome those barriers. One conclusion of this paper is that business is in a paradigm shift today from one of business-as-usual to one of quality and productivity. TQM has been referred to as a continual journey. The same can be said of the paradigm shift if business is to survive, meet its competition, and satisfy its customers.

INTRODUCTION

The relative decline of the American system of production has been well documented. The Massachusetts Institute of Technology Commission on Productivity published under the title, <u>Made in America</u> (1989), observed that the five pillars upon which the post-World War II U.S. economy rested were the vastness of its domestic market, technological superiority, the best educated workforce in the world, its tremendous wealth, and the world's best managers. Such is no longer the case. The rest of the world is catching, or has caught up to the United States (pp. 23-25).

Dobyns & Crawford-Mason in <u>Quality Or Else</u> observed that while the United States was playing one game, its competitors started a new game and the U.S. did not even notice. They further postulate that this was even more important than losing one or more of the pillars (p. 26). This new game involved a dedication to quality as a total system. While the U.S. continued its course of emphasizing quantity because the domestic and global marketplace needed it, a new and more dynamic force emerged in other economies which placed the emphasis upon producing quality. "In the global market, it isn't how many you can make, it's how well you can make them. The new game has new rules" (p. 27).

TQM in the U.S. Air Force is referred to as QAF (Quality Air Force) and is defined by the Air Force as "a leadership commitment and operating style that inspires trust, teamwork, and continuous improvement everywhere in the Air Force" (TIG Brief, March-April 1993, p. 16). TQM can also be defined by characteristics that distinguish it from other management theories or quality programs. Those characteristics are 1) company-wide in purpose and process, 2) emphasis on steady, continuous improvement, 3) focus on performance to satisfy customer requirements (Schmidt & Finnigan, 1992, p. 34), 4) use of tools and techniques for analyzing and

solving problems, 5) strong leadership from those responsible for charting the organization's course and their ability to establish a system of shared values and beliefs (Sashbien & Kiser, 1993, p.3), and 6) developing and integrating a training program with an overall strategy of improvement (Cocheau, 1993, pp 1-33).

In order for a TOM program to be successfully implemented, there is a need for fundamental organizational and cultural change. Assumptions and roles must change. Crosby (1979) observed that there are many faulty assumptions commonly held concerning quality management systems which inhibit acceptance of TOM. Briefly, he noted the following faulty assumptions and offers a counter position.

Quality is something more frequently than not defined as an abstract characteristic, even not possible to define (assumption); but quality means "conformance to requirements" and the more it is defined, the more it can be measured and conformance can be maintained;

Quality is expensive (assumption); but the cost of doing it right the first time is less than correcting problems after they have been created;

Workers are the root cause of most quality and production problems (assumption); but management has set up the systems that workers must labor under and only management can change those systems and meaningfully involve workers in finding solutions to quality problems (pp. 14-18).

Research has identified several key criteria for the successful implementation of a quality management system. Gabor (1990) has synthesized eight broad criteria that, depending upon emphasis, are consistent with the findings of Sashkein and Kiser (1993), Ryan and Oestreich (1991), Cochesa (1993), Ishikawa (1985), Berwick, Godfrey and Roessner (1990), Dobyns and Crawford-Mason (1991) et al. The criteria are:

- Top management involvement, including clear plans for quality leadership;
- A planning process for short- and longterm quality improvement;
- The use of data in spotting and analyzing potential problems and opportunities for improvement, and a consistent data management system to ensure that accurate process information is available on a timely basis;
- Extensive employee involvement in the quality improvement process;
- The availability of quality education and training for employees at all levels of the company;
- A method for measuring customer needs and expectations, and a process for

developing new or improved products that meet those requirements;

- A system for selecting, auditing and training the outside suppliers of materials and components; and
- A system for auditing internal quality management processes (p. 270).

Walton makes the point that the economic position of the United States has declined over the past three decades and that the main cause of this decline is the prevailing system of management. She states that management focused on optimization of a system offers improvement, but this system must have an aim and it must be managed. The bigger the system, however, the more difficult it is to manage (Walton, 1990, p. 9).

This paper proposes to fill a void in the literature by identifying barriers to implementing a TQM program in highly structured organizations. Highly structured will, for the purposes of this paper, be restricted to those organizations characterized by hierarchial lines of authority and channels of communication or those companies heavily influenced by an owner or founder, typical of closely-held corporations.

Information for this paper was gathered through a review of the current literature to determine the barriers to implementing TQM and through interviews with middle and senior management personnel in highly-structured organizations. Three organizations were selected for analysis: Vermont Air National Guard, S.T. Griswold Corp., and the Whiting Corp.

Chapter 1: BARRIERS TO IMPLEMENTING TQM

Subjects

Interviews were conducted with senior and middle managers who have been intimately involved with TQM programs in their organizations. The managers interviewed were David Carrier, Human Resource Manager, E.B. & A.C. Whiting Co. Inc.; Douglas Griswold, President, S. T. Griswold Co. Inc.; LTC J. R. Strifert, Squadron Commander, Vt. Air National Guard; and, Colonel D. Ladd, Group Commander, Vt. Air National Guard. These managers were selected because of their position and/or involvement in the TQM process. Structured Interviews

The goal of the interviews was to determine from each manager what they felt were barriers to TQM, what strategies they felt would overcome the barriers each identified, and what were they doing to implement the strategies. Each manager interviewed was given a statement of purpose for this research and two questionnaires. The first questionnaire inquired as to the commitment they were willing to make in their organization to a TQM program, and the second questionnaire asked the managers to rank the listed barriers to TQM. The list of barriers was prepared by this researcher based upon literature review and preliminary interviews with these managers.

After each interviewee completed the questionnaires, the top three barriers identified by the interviewee were then discussed.

A combined ranking across all interviewees showed the top three barriers to be: 1) Communication, 2) Protecting One's Turf, and, 3) Management.

ANALYSIS

Table 1: Summary of Survey Responses

		Respo	ndent	s	Avq.
<u>Barriers</u>	R1	R2	R3	R4	Rank
Lack of Continuity	9	8	9	11	9.25
Mobility	11	11	10	10	10.5
Action-Oriented People	5	10	3	9	6.75
Budgets	10	3	4	5	5.5
Management	1	4	5	4	3.5
Arbitrary Targets	8	2	8	6	6.0
Size of Organization	7	9	11	8	8.75
Competition Between Depts	. 6	5	7	3	5.25
Communication	2	1	1	2	1.5
Protecting One's Turf	3	6	2	1	3.0
Vertical Structure	4	7	6	7	6.0
R1 - David Carrier.			R3 -	LTC S	trifert.
R2 - Colonel Ladd.			R4 -	Dougl	as Griswold.

Table 1 shows how the respective respondents ranked the eleven barriers. The greatest barrier is communication, with an average rank of 1.5, and the least is mobility with a 10.5 ranking. The average ranking for each barrier is given in the far right column. The average ranking is six (6) with five barriers ranking above average, two (2) barriers even with the average and four (4) barriers below average. No special instructions or definitions were given. Each person was left to interpret the barriers within the context of his own organization.

Communication as a Barrier

David Carrier, Human Resource Manager at E.B. & A.C. Whiting, ranked communication as the second most important element in implementing a TQM program. When asked how communication is a barrier to TQM, his immediate response was, "People not realizing that not everybody knows what they know." Many people feel they are the "bottom rung." In the case of many middle managers, they feel normal communication channels involve sending the message further on down the line. What often happens is that the message gets pigeon-holed and communication simply ceases. It is understandable that workers, as opposed to management, would feel this way because communication is not viewed by them as a responsibility. They do not feel it their place to pass the word. It is their supervisor's role as part of management (D. Carrier, personal interview, October 15, 1992).

The second communication barrier identified is management holding back information. This is not referring to company or trade secrets but information that management should share with their employees based on the employees' legitimate right to know or simple common courtesy. This immediately raises the question as to why management would hold back information from employees in the

first place. The negative connotations are numerous and counterproductive. The two immediate reasons for management withholding information are: first, that they fear the information will go to the wrong people, and secondly, that management sees information sharing as an erosion of their power base (D. Carrier, personal communication, Oct. 15, 1992).

Protecting One's Turf as a Barrier

Knowledge is power. This frequently quoted phrase and its interpretation are the keys to this barrier. As long as a person has information essential to his/her duties, then that person feels needed. Sharing of information is all too often seen as an erosion of one's power base. In fact, power is seen as the most necessary and most distrusted element exigent to human progress (Bennis & Nanus, 1985, p.16). The challenge facing management is to show how information sharing can be a power base to the entire organization, thereby bringing security to each person in that organization. Protecting one's turf is a barrier to TQM because such programs have TOTAL quality as the objective. This means full cooperation between all departments and people within the organization. This barrier typifies Dr. Deming's Point #9, referring to breaking down barriers between departments (1986, p.62).

Another example of protecting one's turf is keeping the job parameters status quo. By nature, most people resist change. Instead of being seen as opportunity, change is seen as a security threat. It means learning new skills that may be taught to many other people. Maintaining status quo means retaining emphasis on individual effort when, in fact, the emphasis should be on team effort. There must be team spirit among all individuals and work units of any organization in order to achieve that TOTAL quality management (LTC Strifert, personal communication, Nov. 5, 1992). Management as a Barrier

Management's failure to exemplify TQM behavior is also identified as a barrier. This seems to be more prevalent at the supervisory level rather than the upper management level. An example is where the older, disciplinarian, supervisor is set in his/her ways and resists new ideas and change. Along a similar theme, the younger supervisors are put in a position of having to prove themselves not only to their subordinates but also to older supervisors (D. Griswold, personal communication, Nov. 20, 1992).

Lack of guidance and leadership is also identified in this category as a TQM barrier (D. Carrier, personal communication, Oct. 15, 1992). The results may evidence themselves in the form of poor financial performance, low morale, or a slump in production and quality of the product. If the problem is ineptness of management, the organization has problems too lengthy to address in this paper. If the problem is that management simply does not know what to do, this problem is correctable and a TQM program would play a vital role. Colonel Ladd pointed out that guidance and leadership is essential in resolving conflicts between long-range and short-range planning, thereby eliminating confusion among middle managers, supervisors, and workers who must carry out the objectives of the organization.

Reluctance of management to take risks is another example of how management can be a barrier to TQM programs. The reasons for

this are varied. Many old-time managers may feel they have done things a certain way for so long and the organization is profitable; therefore, there is no need for change. This is not constancy of purpose as described by Dr. Deming; it is a crippling disease (1986, p.98 & p. 151). Change is a great culture shock to these managers. As one manager explained, "We have paid our dues." The traditional ways of the company supported their rise through the ranks, and these managers saw the benefits of being part of senior management. They now feel entitled to coast to retirement and do not want to upset the apple cart in the meantime. Doing otherwise could mean jeopardizing their position. Fear of failure is probably a better description of this barrier.

In their studies on leaders, Bennis & Nanus (1985) noted that the most memorable and impressive quality of leaders was how they responded to failure (p. 69). The common attitude of the leaders studied was that the possibility of failure was recognized but they then proceeded to concentrate their energies on the task at hand. In the event the leaders met with failure, then it was viewed as an opportunity for learning. They were positive possibility thinkers. Summary

The barriers identified by this paper are what Deming refers to as common causes in that all of these barriers are faults of the management system and are not fleeting events, referred to as special causes. Management therefore has the responsibility to examine the barriers to Total Quality Management and look for strategies to improve the system. Deming cautions not to confuse common causes with special causes, as this only leads to greater frustration of everyone involved, higher costs and greater variability, contrary to the goal of quality management.

VTANG Organizational Assessment

In 1990 and 1991 the Vermont Air National Guard conducted an organizational assessment. Organizational development workshops There were six different workshops and each workshop were used. consisted of full-time technicians, active guard-reserve personnel, and traditional guardspeople. Officers and enlisted personnel were together in the groups, with the enlisted personnel being in the The workshops were conducted in a manner that would majority. minimize or eliminate rank as an influencing factor and provide an opportunity for the greatest number of personnel to participate. The size of each workshop varied from 20 to 60 people with approximately 250 people participating in the workshops. each workshop, participants were asked what they considered the strength, the weakness, and the ideal of the Vermont Air National Guard (VTANG). The participants' responses were then discussed in each workshop and each of the six workshops presented to LTC Strifert the top three strengths, weaknesses and ideals they identified.

Table 2 is a tabulation of the top three responses for each category. The project facilitator was Captain K.A. Fick under the direction of LTC John Strifert, and the survey is used with his permission.

Table 2: VTANG Organizational Assessment Workshop Responses

	<u> Ideal</u>	<u>Strength</u>	<u>Weakness</u>
Communication	3		5
Teamwork	2	14	3
Mgt/Leadership	9		12
Training/Ed.	2		2
Rewards	2		
Facilities	2		
Attitude	3	1	1
Personnel		_ 7	
Totals	23	22	23

Table 2 shows a consolidation of responses from the workshops. The similarity in responses shown in this table to those in Table 1 can be seen in the identified weaknesses (barriers). Table 1 showed the biggest barrier to be communication while the VTANG survey The VTANG survey showed communication to be the #2 weakness. showed management and leadership to be the #1 weakness while in Table 1 this ranked third as a barrier. In each survey communication and management are at the top of the lists when viewed as barriers or weaknesses.

Chapter 2: STRATEGIES TO OVERCOME THE BARRIERS

As previously stated, it is management's responsibility to develop strategies for overcoming barriers to TQM resulting from common causes. This section discusses the strategies most often suggested by the interviewees.

Leadership

Perhaps the best and most important strategy in overcoming management as a barrier to TQM is to make the top manager the TQM driver. If he is not the TQM driver, it must be made absolutely clear that the TQM driver speaks with the same force and authority as the CEO. The importance of this point is shown in an example in which a CEO of one company asked the CEO of another company to join him on what was felt to be a very important matter. The message read "If you cannot come, send no one" (Deming, 1986, p. 21). This is so important that if the CEO is not the TQM driver, then it must be very clear he speaks for the CEO.

Communication

The strategies businesses can employ are relatively simple and cost efficient. The first thing any organization must do, though, is to formulate a communication plan. This is echoed by Chester I. Barnard who stated "The first function of the executive is to (Schmidt & develop and maintain a system of communication" Simply defined, communication is the Finnigan, 1992, p. 266). The information disseminated must be exchange of information. timely, accurate and the media selected must be appropriate to the message to be communicated. This is essential to control the rumor mill and give validity to the message (LTC Strifert, personal interview, November 5, 1992).

Involvement

Greater employee involvement in the decision-making process is another strategy that works. As one CEO explained, ordering an employee simply does not work. On the other hand, greater employee involvement enhances the exchange of information and promotes communication (exchange of information) between management and the employees. This strategy empowers employees and, according to W. Edwards Deming, helps remove the barriers that rob people of pride of workmanship (1986, p. 77). Employee involvement is essential to the success of a TQM program, otherwise, management is helpless (1986, p. 87). This strategy also means management is extending trust to the employees where in the past there has been suspicion. The ability to trust others, even at great risk, is one of the five key skills for trust through positioning, a strategy for human handling (Bennis & Nanus, 1985, p.26 & p.67). Education and Training

Education is another tool being used to break down the barriers to TQM and sends a message that the company is concerned about employee betterment. Education has been referred to as the mainspring of our economic and social progress and as the highest expression of achievement in our society (Nanus, 1989, p. 174).

Training is used by E.B. & A.C. Whiting to promote TQM programs, and they train company personnel to be trainers in the skills needed to implement such programs. This provides consistency in the message given, authority because the message comes from higher up, and validity because the message is delivered by trusted fellow workers (D. Carrier, personal interview, Oct. 15,1992). It is not just the worker though that needs training. Dr. Deming states that management needs training to learn all about the company from incoming material to customer and thereby understand the problems that deny the worker the ability of carrying out his job with satisfaction (1986, p. 52). Summary

All of the strategies, communication, employee involvement, education, and training could be implemented simply by altering the business as usual approach conducted by many companies today. Dobyns & Crawford-Mason (1991) refer to quality programs as a way of thinking and the more one practices, the better one gets. This allows business to concentrate on a program of continuous improvement, thereby preventing problems before they even arise. These are findings shared by each of the managers interviewed.

Chapter 3: OBSERVATIONS and CONCLUSIONS

Total Quality Management is a philosophy that guides the actions of all within an organization. This is the most important observation reached in this research project. Even with all of the advice from modern management philosophers on how to start a TQM program, what to look for, or how to measure its success, it is clear from the interviews conducted that TQM must be an inner sense or way of thinking. It is true that TQM must be a way of life, a way of doing business. Total Quality Management programs must have certain traits to be successful such as being customer driven, but the push to make a commitment to TQM and the glue that holds the program together is the attitude of the employees.

The managers interviewed for this paper expressed a desire to have people with a good attitude, a "can do" attitude. People with this type of attitude want to do the best they can, not just put in their time and do the minimum expected of them. When these people are faced with a challenge, they do not look at roadblocks as barriers but as just another challenge to overcome in order to attain the ultimate goal. They accept and promote change for the

betterment of the entire organization.

An observation of the strategies recommended shows that communication, education, and training were the most often cited. Communication is easier said than done and is often subjective in its measurement. Education and training are more objective in measurement but also more costly, and therefore, not used as often.

One ironic observation of this research is that the number one barrier identified is also the number one strategy to overcome barriers and implement TQM programs. Deming does not give communication itself as a barrier but he does show the importance of communication and its effects under Point # 12 (Deming, 1986, pp 78-83).

Conclusions of this research show that American business must refocus its energy and resources. The object of this refocusing effort should be the process and infrastructure of the business. This is necessary for organizational stability and competitiveness (Peters, 1987, p. 474). The positive aspect of the interviews is that senior management knows what it must do to succeed. The negative aspect is that many strategies were couched in terms of what the organizations must do rather than in what they are doing. This demonstrates a paradigm shift in business today. The shift is not complete but is moving from business as usual to business that benefits all stakeholders.

LIST OF REFERENCES CITED

- Bennis, W., & Nanus, B. (1985). <u>Leaders</u>. New York: Harper & Row.
- Bossert, Capt. (1993, March-April). QAF: Bridging the gap between theory and application. <u>TIG Brief</u>, pp. 16-17.
- Block, P. (1991). <u>The empowered manager</u>. San Francisco: Jossey-Bass Publishers.
- Deming, W. E. (1982). <u>Out of the crisis</u>. Massachusetts Institute of Technology.
- Drucker, P. F. (1989). <u>The new realities</u>. New York: Harper and Row.
- Donnelly, J.H., Jr., Gibson, J., & Ivancevich, J. (1987). <u>Fundamentals of management</u>. Homewood, IL: Business Publications, Inc.
- Hersey, P., & Blanchard, K. H. (1988). <u>Management of organizational behavior</u>. Englewood Cliffs, NJ: Prentice Hall.
- Kreitner, R., & Kinicki, A. (1989). Organizational behavior.
 Homewood, IL: Business Publications, Inc.
- Nanus, B. (1989) <u>The leader's edge</u>. Chicago: Contemporary Books.
- Parker, G. M. (1990). <u>Team players and teamwork</u>. San Francisco: Jossey-Bass Publishers.
- Peters, P., (1987). <u>Thriving on chaos</u>. New York: Harper and Row.
- Scherkenbach, W. W., (1991). <u>The Deming route to quality and productivity</u>. Rockville, MD: Mercury Press.
- Schmidt, W. H., (1992). <u>The race without a finish line</u>. San Francisco: Jossey-Bass Publishers.
- Walton, M., (1986). <u>The deming management method</u>. New York: Putnam Publishing Group.
- Walton, M., (1991). <u>Deming management at work</u>. New York: Putnam Publishing Group.

$E = mc^2$ A Formula for Successful Empowerment



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E = mc² A FORMULA FOR SUCCESSFUL EMPOWERMENT

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ABSTRACT

This paper presents a discussion on the principle of empowerment. It begins with a discussion of what most people recognize as a valid discussion of the degrees of empowerment--from an environment of total control of people by systems and leadership, up to full delegation of authority--empowerment. The problem is posed as to how to realize this ultimate state of full delegation, an approach that is lacking in most of the current discussion of this topic. The paper presents three necessary and interconnected concepts that, if applied correctly, can result in the reader's organization transforming into a more empowered one. These three concepts are character (ability to do the task); character (trustworthiness/trust, or the willingness to do the right thing at the right time), and mission (corporate direction). These are condensed into a simple formula $(E = mc^2)$ that should make it easy for the reader to remember. Each concept is fully explained, and the responsibilities of both leadership and worker with respect to development are discussed. Although a formula for implementation is provided, the paper is far from prescriptive in that application to each organization is unique; the ideas are important and universal; how a leader decides to adapt them is not. The paper closes with a summary that reinforces the three concepts, and the fact that each is necessary and interconnected with the others for successful empowerment.

INTRODUCTION

One of the questions that I am most often asked in my role as a Quality Air Force consultant is, "What do you know/what can you tell me about empowerment?" One thing for sure, and that is that the subject of empowerment is one of the hottest topics of discussion at all levels of the Air Force today, as well as in the industrial and business arenas. People are most effective when they have the freedom to act within a set of defined values, for a common purpose (1:37). The competitive environment of today's Air Force virtually dictates an empowering leadership style, because the structured decision making processes of the past are not responsive to the pace of today's change.

Another aspect of empowerment is that it can be liberating and motivating for those subordinates and leaders fortunate enough to be in that environment. Today's workers expect more from the job than simply a paycheck. They want challenge, responsibility, autonomy, and discretion, which an empowering environment provides (1:252). Leaders are spared the burden of decision making down in the weeds, freeing them to instead focus

their attention on the more necessary aspects of leadership--organization and personnel development.

Then there are those who have not had the opportunity to work in an empowered environment--leaders and workers both-- who likely can identify with the burdens of controlling systems, procedures, and reviews that add no apparent value to the outcome. They are continually manipulated and bogged down by the taxing inertia of the status quo.

It is my guess that most people work in an environment that lies somewhere in between the two systems described above. In fact, one could define different levels of empowerment as follows:

Controlled:: the member has all actions totally scripted; no decisions are required, expected, or allowed.

Task delegation: the member is provided the tools and directions on how to complete a task. All activities are under the control of the member, but decisions must be pre coordinated with, or made by, the supervisor.

Decision delegation: the member is provided the tools and the end state desired. The member is free to take any action congruent with the goals and norms of the organization; the supervisor must be briefed after the completion of the detail.

Authority delegation: the member is completely free to solve any problem. The member decides best how to solve the problem, using tools and methods he or she determine are appropriate. The supervisor does not have to be briefed before, during, or after.

Most readers can easily identify with one or more of the environments described above. In my career, I have had the opportunity to work in environments that were empowering and liberating, and in environments that were controlling. Organizations, as well as the people in charge, were equally responsible as to how much authority was doled out and how much control was retained. To further expand my appreciation for each of these environments, I have conducted intensive study of the available literature in order to bring some light to bear on this high demand, yet frustrating topic of empowerment. It is the results of this research that I am presenting in this paper.

DEFINITION

To properly discuss the principle of empowerment and the keys to its attainment, it is best to begin with a definition to establish common ground. There are formal definitions and technical definitions of empowerment to guide our study. For example, the Quality Approach discussion is typical: "...empowerment at the point of contact gives people the opportunity, authority, and resources needed to get the job done. When managed wisely,

empowerment enhances the role of leaders and followers. The goal is to create an environment in which subordinates, with proper training, can continually improve the organization."

This is an excellent definition of the end state: empowered organizations and empowered people. However, it doesn't provide us with the means to get there. In describing the end state (what could be or what should be), it does not give the reader a useful bridge on how to get there from the current state, and that is the purpose of this paper--to give the reader insight on how to achieve the desired empowered state. This is not, however, a prescriptive approach; that is, no formula is provided that can be plugged in to an organization that will automatically result in empowerment. Rather, ideas and concepts that are prerequisites to an empowered state are discussed and explained, so that the reader can adapt them to the unit's or organization's specific situation.

To better serve the purpose of this paper, it is necessary to develop a working definition. Empowerment is when "people are capable and willing to carry out focused, meaningful tasks." There are three attributes embedded in this definition, which are also the necessary conditions, or enablers, for empowerment. Capability means that one can execute the tasks required of him or her. Willingness means that people do the right things at the right times, not just doing what is convenient or expedient. Finally, focus and meaning give the workers a sense of direction and a sense of purpose within which to carry out tasks and make decisions. These conditions are reflected in Quality Air Force values: competence (capability), integrity or character (willingness), and mission (focus and meaning). These three characteristics I have boiled down into a simplified formula that should be easy to remember:

E (empowerment) = M (mission)
$$C^2$$
 (competence and character)

Note that, just as in Einstein's theory of relativity, all three factors are necessary for completeness. The paper is designed to explain each attribute in detail, so that readers can gain a better appreciation for what empowerment requires--both of leaders and workers; this is a feature that is unique to this presentation. The emphasis in most discussions of empowerment focus on what leadership must do. In this paper, there are responsibilities to be fulfilled by both parties in the empowerment equation. Leaders have to establish the proper environment--nurturing, mentoring, trust, and direction; but workers also have a responsibility to develop the broad capability to perform, and must exhibit trustworthiness in order for leadership to emplace trust in them. Leadership cannot pass the baton unless the workers are present and ready to accept it.

Before beginning the discussion, I recognize that there are some aspects of the Air Force mission that are not fully compatible with the principle of empowerment because close control is mandatory; for example, movement and control of weapons, handling of national security information, and so on. This paper is not meant to advocate abandoning those necessary controls; rather, it is meant to create positive thinking as to other aspects of the mission that can be freed up for empowerment.

KEYS TO EMPOWERMENT

COMPETENCE

Competence is one of the Quality Air Force values. According to the Quality Approach, competence "is the watchword of a master craftsman. Competent Quality Air Force members build their skills, knowledge, and experience in the classic tradition of one who knows that competency is an ongoing experience. Whether you flip burgers, turn wrenches, or write software, strive to be the best--become the expert." Webster's defines competence as one who is competent; competent is defined as well qualified, capable, fit; sufficient, adequate.

To further enhance the understanding of this key empowerment concept, competence can also be defined as an acquired ability that is specific to conditions, applied to an activity. There are two critical attributes to competence embedded in this definition. The first, from the working definition, is that competence is an acquired ability, that is, the ability to get the job done. This means that the development of competence is deliberate and learned. Competence is not talent. Talent is naturally occurring, and is performed at the unconscious level. Competence begins at the conscious level. Only after repeatedly exercising that skill does the competent person move that activity into the unconscious realm. To determine if one is talented or competent, ask the person how they did something. If the response is a detailed and clear explanation, that is competence. If the response is, "it just happens" then that is talent. Warren Bennis and Burt Nanus talk indirectly to this issue. "The second component of empowerment is competence, meaning development and learning on the job...work was a 'fine form of post graduate education.'" "...competencies can be learned...whatever natural endowments we bring to the role of leadership, they can be enhanced; nurture is far more important than nature in determining who becomes a successful leader." (3: 83 and 3: 222)

How does one acquire ability to become competent, so that the desired empowered state can be realized? Bennis and Nanus: "Books can help you understand, but most of the learning takes place during the experience itself." Learning takes place at both the cognitive (mental) level and psychomotor (i.e., hand-eye coordination) level. To fully develop competence, the training must not only cover the "physics" of the situation, but must include the hands on aspects as well. As an example, when you learn to drive a car, it is highly psychomotor in nature (that is, hand/foot/eye coordination), but cognitive skills are just as important: what are the rules of the road; how do the laws of nature impact the behavior of the automobile, and so on?

It is leadership's responsibility to develop competence in their people. Covey says that leadership is more than setting a good example and developing relationships. One needs to teach; that is, leadership has a responsibility to develop competence in the workers. Deming's point 6 says that leaders must develop skills in new hires and assist in the learning process (6:35). How? According to the Quality Approach, mid-level leaders' roles include coaching, mentoring, and teaching. Bennis and Nanus indicate the

relationship between competence and empowerment: "...They gain a sense of importance, as they are transformed from robots blindly following instructions to human beings engaged in a creative and purposeful venture." Competence provides the individual with the opportunity to move away from being controlled, to being empowered.

Now that we have looked at the first attribute of competence, that it is an acquired ability, let us turn to the second, that competence is specific to a condition, or competence must be *current*. Why is this so important? Quality leadership demands that we create a vision that doesn't merely respond to the future, but to create one that actually shapes and controls the future. Without currency, we will merely be passengers in the boat, subject to the whims of the prevailing currents. The pace of change, both within the Air Force and without, is fast and furious. Covey proposes that "If a junior executive neglects her professional development and continuing education, she can easily and quickly become obsolete in a world changing at dizzying rates." (5: 52) Donald Michael, in referring to the new competence, talks of executives "responding to the future." (3: 189) All these references point to the fact that we cannot rest on today's learning. Tomorrow will be sufficiently different so as to require us to continue our professional and personal development. If we are to chart the future course, we must insure that we are "currently" competent always, because our competence as we know it today may not be appropriate in the conditions of tomorrow.

This discussion implies maintaining currency along only one dimension-the technical dimension, be that wrench turning, analysis, or leadership. However, competence in the broader context of empowerment requires that we maintain currency in multiple dimensions. Bennis and Nanus describe changes in the airline industry that not only threaten the future of the airline business, but are already making an impact today. Changes are happening in all aspects of that business: finance, consumer preference, technology, and Government regulation (3: 173). To not be current in all relative dimensions is to be incompetent, and that is an invitation for disaster, reclaiming of control by those in charge, and a loss of empowerment. John Naisbitt and Patricia Aburdene give numerous examples of change coming in this and subsequent generations:

"For the last two decades US women have taken two thirds of the millions of new jobs created in the information era..." (8:229)

"To be a leader in business today, it is no longer an advantage to have been socialized as a male." (8:229)

"The Pacific Rim is emerging like a dynamic young America but on a much grander scale." (8:184)

And so on they go. The point is, to be fully competent to the point where empowerment can take place, competence must be viewed AND DEVELOPED along many dimensions-technical, cultural, gender, and so on. To neglect this critical aspect is to guarantee trouble down the road, not to mention the possibility of the failure of your attempts to

empower or to be empowered. We can all think of recent examples of discrimination and harassment that were likely due to a less than full appreciation of all the issues in the work environment today. Failure to develop in any key area means that leadership eventually must intervene, resulting in more control and less empowerment.

How do you keep current? James P. Morgan, upon moving to Atari as chairman and CEO, admitted that he had much to learn about the new business he was in. He had the organization bring him up to speed on the technologies, products, and competition. He would walk the halls and talk to people, always with the intent to learn. He reflects on the need to maintain competence through the exercise, practice, and extension of skills, and the need to maintain a continuous learning and development program of some sort, either formal or informal (3:205). you can't resist the need to do this, for to do so you run the risk of becoming obsolete. You desktop computer is a good example of this--in just the last ten years, this technology has evolved through at least three generations, with each one providing more for the user, but at the cost of more complexity and more required skills. Virtually no environment is immune from this.

CHARACTER

The development of competence in people means that they have the ability to act. This is a necessary, but not sufficient condition for empowerment. Just because a person can act does not mean that they will act. Only a person who has a strong character will act in all situations. Character is reflected in another Quality Air Force value, integrity. Integrity "...provides the foundation of trust--standing by our word and our commitment to honesty. Our demonstrated integrity helps in building a Quality Air Force, which recognizes the worth of the individual's contribution to the team effort. In a high-risk aerospace environment, integrity is a life-essential element of every job, from filing work order requests to launching combat sorties."

The Quality Approach also refers to the character issue in another way. In the explanation of the Quality Air Force System, it says that Leadership's responsibility is to foster an environment that fosters trust, teamwork, and pride. It is implied for the individuals who work in the quality culture; individuals are the process experts. "They must learn...and understand..."

Why is character so important to empowerment in the Quality Air Force? Peter Block gives us a clue. He says, "...When we choose autonomy we realize that there is nothing to wait for. We do not require anything from those above us...I must commit myself..." (7:17) A person who lacks character, who lacks the will to do the right things at the right time, falls victim to the blame game. Block goes on: "...Our willingness to submit to authority rewards us by letting us off the hook...when something goes wrong, it's not our fault...If it's not my fault, I can't fix it." (7:27) Covey expresses a similar theme: "...At the low end are the ineffective people who transfer responsibility by blaming other people, events, or the environment." (5:40) In an empowering environment, the workers need to

step up to the challenge of leadership and accept the responsibility to act. To not do so is to invite leadership to come back in to your work lives and reclaim control.

There are two sides of the character coin: trust and trustworthiness (5:182). It is crucial for successful empowerment that leaders AND workers both understand each. Trustworthiness is a persona trait that must be displayed by the individual and accepted by others before others will put there trust in that individual. This applies to both the leadership and the workers. If workers are not trustworthy, leadership has no obligation to put trust in them, and empowerment will not exist. Likewise, if leadership is not trustworthy, the workers will not trust them and will focus more on protection instead of mission tasks, which is interpreted as a lack of trustworthiness by the leaders. A vicious cycle has been started.

Trustworthiness is a personal feature that shows that you will do those right things, that you will maintain the helm and not take the ship off course unexpectedly or without reason. To be trustworthy, you need to demonstrate that you will do what best for the common good at the risk of sacrificing what is good for you, the individual. Where workers decide to relinquish control back to systems and supervisors, they are showing that they are not trustworthy. Trustworthiness requires continuous, disciplined development, that starts and ends with you, and you alone.

Your trustworthiness *must* precede someone else putting their trust in you. However, trustworthiness is a perception of you by others. To establish your trustworthiness, you need to do those things that others value. A discussion of trustworthiness quickly becomes delicate, as it centers on the interrelationship of values at the personal level. To evolve into a trusting relationship, then, each person in the relatinship must accept and respect the values of the other(s). As a trusting relationship evolves, workers can better focus on the tasks at hand and less on the protective structures and systems; leaders can delegate more and more with confidence that the right things will be done. This is a key concept in the empowering formula.

For workers, if you have developed competence, you need to begin acting in a way that demonstrates trustworthiness. Are you responsible in carrying out assigned tasks? Do you make decisions and carry out your orders that benefit the group, or do you act in a manner that benefits only you? Do you strive continually to improve your abilities?

Leadership must also be trustworthy. Tom Peters gives some clues: "The role of the leaders is a servant's role. It's supporting his people, running interference for them. It's coming out with an atmosphere of understanding...every employee must benefit from the company's success." Sam Walton of Wal-Mart fame would visit all of his 750 stores each year, not to inspect but rather to visit with the employees and to listen to their concerns (4:313). Leadership visibility is vitally important to demonstrate empathy, which leads to a feeling of trustworthiness.

Deming alludes to the issue of trustworthiness in leadership in point eight of his fourteen points: "Drive out fear (6:35). Many employees are afraid to ask questions or to take a position, even when they do not understand what their job is or what is right or wrong...To assure better quality and productivity, it is necessary that people feel secure." In other words, leaders must exhibit that characteristic of trustworthiness in order for employees to put their faith in the hands of leadership, who are now entrusted to do the "right thing" for the workers.

Once a person (leader or worker) has established that they are trustworthy, others can then begin placing trust in them. As workers continue to demonstrate over and over that they are reliable, and are dedicated to the mission, leaders can place more and more trust in the people. As leaders demonstrate that they are understanding and they are "in it" with the workers, the workers likewise will turn more of their energy from keeping their guard up into the tasks at hand. When leaders show empathy and help change existing systems from burdensome to supportive, and recognize that these systems are often to blame for worker failure, the workers will place ever increasing amounts of trust in the leadership and will aspire to higher levels of personal greatness. In today's Quality Air Force, leadership is charged with creating an environment that fosters risk taking. When people work in an atmosphere of trust, total trust, they'll put themselves at risk, which breeds growth, self-confidence, and continuous self-improvement.

DIRECTION

Competence is high--training and education programs have the people skilled not only in the primary disciplines, but in multiple dimensions. The people can do the jobs at hand. Character is flowing. That all are trustworthy and trust in each other is a way of life. Do we have empowerment? Not yet, because while we are assured that people can do the job, and will do the job, they do not have a focus or a basis for common decision making. How do leaders insure that the workers make the rights kinds of decisions? How do the workers satisfy themselves that their efforts are at least on the right track? There must be a unity of purpose, a cohesion of values. Cohen and Bradford point to this in their discussion of the twelve pillars of successful organizations. These include shared vision and values, goals, and focus. Clearly, an appreciation of this concept of corporate direction is another key to successful empowerment.

When people understand the values of an organization, what it is that the organization does, and where it is headed, and are emotionally hooked, then the right kinds of decisions can be made without the close controls. There doesn't have to be a customer relations guide, because through the core values the right things to do are obvious. Job descriptions and union collective bargaining agreements go out the window because everybody identifies with and believes in the mission--leaders and workers alike. Bennis and Nanus explain: "...A shared vision of the future also suggests measures of effectiveness for the organization and for all its parts. It helps individuals distinguish between what's good and what's bad for the organization, and what's worthwhile to want

to achieve. And most important, it makes it possible to distribute decision making widely." (3:92)

Who's responsibility is it to provide the focus, the direction, the values, and the style? Quite clearly, it is the leadership--the senior leadership--in the organization, that must do this. It is the leader's role is to create a vision (5:165-6). The Quality Approach: "Leaders set the vision..." Leadership owns the big picture. Their attention must directed not down into the weeds but forward to the future. They have the experiences that help them best interpret what the outside environment is doing, how it is changing, and how their organization can best play. They have spent their life wearing the blue, living the culture, and testing the value system. They are in the best position to lay the groundwork for tomorrow.

And what kind of direction should leadership provide? Bennis and Nanus: "...the manager...operates on the physical resources of the organization...the leader operates on the emotional and spiritual resources...Great leaders often inspire their followers to high levels of achievement by showing them how their work contributes to worthwhile ends." (3:92) Covey talks of a compass for leadership: "The compass orients people to the coordinates and indicates a course or direction..." Maps "become obsolete...inaccurate maps are sources of great frustration for people who are trying to find their way or navigate territory." (5:96) In short, it is not micro direction or direction of any sort that leaders provide—they provide the purpose for being, and a concept of the desired end state at an emotional level that the workers can understand, believe in, and fight for.

This direction that we are talking about is essentially the strategic plan part of Quality Air Force. From the Quality Approach: "Strategic planning is the process by which an organization envisions its future and develops special strategies and plans to achieve that future." In the Quality Air Force strategic planning model, look at steps 2, 3, and 4: Step 2: Values assessment; Step 3: Analyze mission; Step 4: Envision the future. A well thought out, well constructed strategic plan will provide leadership with the final piece of the puzzle necessary to achieve successful empowerment.

CONCLUSION

Empowerment requires three elements to be successful--competence, character, and a clear mission. Like the formula for relativity, each is necessary but, alone, not sufficient to guarantee the desired result. Competence is the ability for the individual to do the requisite tasks, and consists of two parts--ability and currency. It is the responsibility of the leadership to establish an environment whereby workers can develop competence, and to mentor their subordinates' development. It is the responsibility of workers to pursue professional development in all the dimensions required by the job. Because of an ever changing environment, comptency is an on-going, continuous process.

Character means that the individual will do the right job at the right time. CHaracter development is less sstructured and more personal than competence; it reflects more on

personal value. The two aspects of character are trustworthiness and trust. Trustworthiness is a personal value that must be exhibited by you and accepted by others. This precedes trust, the second aspect of character, being placed in you by others. Trust is the enabling feature of character, for without trust there is no delegation; without delegation there is no empowerment.

Finally, the work to be done must have focus and meaning, which comes through the development and acceptance of a carefully crafted mission statement; this is the responsibility of the leadership. Embedded in this mission are the expectred corporate values and operating style. Workers who understand and have bought in to the mission have no need for paper walls in the form of procedures guides and job descriptions, because the right things to do are readily apparent.

Each of these elelments of empowerment must be tailored to the environment in your organization. The competence required for the supply mission is unique and different from the acquisition function. The degree of trust required for some missions is much higher than for otrhers, because of the impact of unfavorable results. Finally and most obviously, the mision for each organization is unique.

E=MC². The power of the formula lies in its simplicity.

REFERENCES

- 1. Influence without Authorty; Allan R. Cohen and David L. Bradford; John Wiley and Sons; c1989,1991.
- 2. Developing High Performance People--The Art of Coaching; Oscar G. Mink, Kieth Q. Owen, and Barbara P. Mink; Addison Wesley Publishing Company; c1983.
- 3. Leaders-The Strategies for Taking Charge; Warren Bennis and Burt Nanus; Harper and Rowe/Perennial Library; c1985.
- 4. A Passion for Excellence-The Leadership Difference; Tom Peters and Nancy Austin; Warner Books; c1985
- 5. Principle Centered Leadership; Stephen R. Covey; Fireside; c1990,1991.
- 6. The Deming Management Method; Mary Walton; Perigee Books; c1986
- 7. The Empowered Manager-Positive Political Skills at Work; Peter Block; Jossey-Bass Inc; c1987.
- 8. Megatrends 2000-Ten New Directions for the 1990's; John Naibitt and Patricia Aburdene; Avon Books; c1990.

Empowerment – "Service vs. Line Organization"



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EMPOWERMENT

SERVICE VS LINE ORGANIZATION

JOYCE MC DANIEL, LINDA HAWTHORNE AND RICHARD YATES

SUMMARY/ABSTRACT:

A frequently heard statement is "you can't use TQM and EMPOWERMENT in this organization because". Well, we are here to dispel these myths and to show when implemented with the correct approach *empowerment* will work in both a service and a line organization, with civilians and military. The key factors are really very simple, but often not understood or followed for one reason or another. This paper will take you step by step through the approach, deployment, and result stages of empowerment in the 653d Medical Group and the C-130 System Program Office at Warner Robins Air Logistics Center.

INTRODUCTION:

The word *empowerment* has a vast number of meanings to a diverse group of individuals. To some it means that they have been given the power to run the organization as they see fit, for others it means they have now been "dumped on" and are responsible for the whole show. Some supervisors look at it as a relinquishing of their power, while others see it as a way to "get rid" of a problem area. Of course none of these are correct interpretations of the concept of Empowerment. When individuals are empowered they do receive a certain amount of authority to guide their phase of the operation to the fulfillment of predetermined objectives. These objectives have been determined by individuals in positions of responsibility who, after evaluating both short and long range plans, determine

where the section should be moving to next. This means that for management it is not a relinquishing of authority, but a redirection of responsibility. Upper levels of management (and those in the cascade flow down the chain) now have the role of setting goals; while, those performing the task of getting them there; now, are the ones who must determine the optimal route. Management, at all levels, has become a coach, mentor, tutor, and conductor responsible for facilitating movement of organizations to the desired objectives. In turn they must convey this to the work force below them through both their words and their actions. They must establish the parameter in which the staff is empowered and then live and work in that zone. The workers in turn must understand that this is their zone of responsibility and that they will be held responsible for successful implementation of the process necessary to meet the goals.

To quote Major General Fain "Empowerment means you have the authority to make decisions that you are capable of making. You must know what your decision space is and what you can do to live within it.... As you grow, your empowerment should grow with you." This is not a new, nor should it be a confusing concept, it simply means that you must communicate with each other the parameters of the empowerment and then be responsible for accomplishment of the tasking. For some, this may mean a limited scope at first, but with the options to expand as one proves their capability and expands their knowledge of the process their scope will broaden. Empowerment does not just happen, it takes hard work and perseverance to ensure that all aspects are communicated between all parties. When done correctly, empowerment promotes personal growth and improves confidence. Empowering employees to make meaningful decisions helps them to look at the workplace in a new way. It creates understanding about how different people and jobs fit into the organization. This new perspective is invigorating, energizing, and personally rewarding.

APPLICATION:

We have looked at two organizations which seem to be completely different in the nature of their operations but who have both been successful in the implementation of the **empowerment** philosophy. The first group is the C-130 System Program Office, an organization which provides program depot maintenance and unscheduled depot level maintenance for all C-130 aircraft world-wide. In addition they are the central purchasing agent for all new C-130's and spares and provide the required follow-on technical support. The other agency is the 653d Medical Group, responsible for providing continuously improving medical, dental, occupational, and environmental health services for TEAM Robins. These two organizations have one thing very much in common... they have senior leadership who understand the concept of empowerment and who are willing to use it to optimize the output of their people. They realize that empowerment increases interest in work challenges and that most employees enjoy tackling "real" tasks and working out genuine solutions.

This happened in the C-130 world when our Depaint Team was motivated by the knowledge that methylene chloride used to chemically strip paiant from aircraft, was an ozone depleting chemical and had to be eliminated in the near future. The managers empowered the team to investigate and decide how they wanted to replace the current environmentally unfriendly method for depainting C-130 aircraft. The fate of the process was solely in the hands of the team. Their original goal was to reduce the amount of methylene chloride used to depaint an aircraft. The final results could very well be the elimination of methylene chloride. Methylene chloride usage has been reduced from 37 barrels per aircraft to approximately 1 barrel per aircraft. They have already reduced the usage by 95%. Each time the team came up with problems implementing this process, they alone decided what to do to make it work and did it.

The following chart shows the monetary savings:

Per Airc	eraft
Chemical depaint process	Bicarbonate process
Material Cost	Material Cost
\$12,025	\$3,200
Energy Cost	Energy Cost
\$3,333	\$3,199

They saved monetarily and environmentally by using the Bicarbonate process. As this team grew, their responsibility grew with them.

The Medical Group has been working in this environment for several years now and has numerous success stories. The first one took place in 1989 when the Pharmacy identified a problem with the delivery of prescriptions to the patients in a timely manner. They had a clear direction from Command, a time goal that they were to meet. They were tasked by the organization commander to develop a system to meet this requirement. They were given the guidance that money and space was not a limitation, but that final approval did remain with the Commander. They identified the need to expand the pharmacy floor space, increase the number of service windows and to computerize the system. This was accomplished with Command support and the goals were met through the initiatives developed by the work force. More recently a Federal regulation was implemented that mandated an "Early Intervention Program" be established at all military installations with section six schools. Robins was one of only two Air Force Bases in the CONUS that had this scenario. Again with the empowerment of the Commander a Integrated Product

Team was developed and given both direction in which to proceed and the window in which to operate. They have quickly become the lead agent for the CONUS implementation of this program for the Air Force. Within sections OIC's and NCOIC's have been empowered by their supervisors to run their section to meet their customer needs. This has enabled the work force to develop customer surveys to identify needs and determine potential ways to meet and exceed them. Empowerment has increased mutual commitment, support, and effort in improving quality throughout the medical facility frequently leading to areas tackling issues they would have been considered beyond their scope without empowerment.

Another situation within the Medical Group is in our Occupational Medicine Services (OMS). In November 1993 the chief of that section resigned and, to date has not been replaced. Because the staff understood and accepted the fact that their vision, mission and goals could not suffer as a result of this, each individual committed themselves to superior work performance. With a determination to "pull together" and maintain high OMS standards, management created a teamwork environment with the proper coaching and supervising. Key workers were empowered to handle some procedures and decisions that were formerly channeled through the chief. As a result of this, management discovered that some of the informal tasks which usually took a lot of time just to be reviewed and acted on by the chief, could now be taken care of in a lot less time.

RESULTS:

In an era faced with unprecedented down sizing, we have had to develop a process to maintain and even improve an already first-class operation. Empowerment is proving to be that process. The question then is where are we on the road to successful implementation, are we really walking the talk? The following is a simple matrix which can help in determining the answer:

EMPOWERMENT PROCESS

6 •	M A N A G E M E N T	W O R K E R	ORGANIZATIONAL
	C O M M I T M E N T	C O M M I T M E N T	AWARENESS
EMPOWERMENT	CREATING A	AUTONOMOUS TEAMS	VISION, MISSION AND
	TEAMWORK	ANALYZE AND	GOALS ARE UNDER-
	ENVIRONMENT	IMPROVE PROCESSES	STOOD AND ACCEPTED
INVOLVEMENT	COACHING	AD HOC TEAMS WORKING ON PROBLEMS	VISION, MISSION AND GOALS ARE DOCU- MENTED
PARTICIPATION 2	SUPERVISING	INDIVIDUAL Work Performance	TASK ORIENTATION

EMPOWERMENT PROCESS CONTINUED

	WORKER ABILITY	MANAGEMENT CONTROL	WORKER MORALE
6 EMPOWERMENT	INDIVIDUAL SKILLS WITH UNDERSTANDING HOW THEY INTERACT WITH CO-WORKERS	PROCESS RELATED TEAM DECISIONS INPUT TO STRATEGIC DECISIONS	TEAM RECOGNITION AND GAINSHARING
INVOLVEMENT	INDIVIDUAL SKILLS NEEDED TO DO JOB	LIMITED TEAM-BASED DECISIONS TEAM RECOMMENDATIONS	SOME TEAM PARTICIPATION AND RECOG- NITION
2 PARTICIPATION	TASK ORIENTED SKILLS	TOP DOWN DIRECTION	FUNCTIONAL PAROCHIALISM INDIVIDUAL PERFORMANCE

RESULTS:

The results have been dramatic where empowerment has been implemented and it has helped ideas reach their full potential. With every employee understanding their vast opportunities as well as their limitations, we have been able to eliminate rework, reduce waste and show dramatic savings in many of our programs. Remember that every employee needs to generate ideas and every idea deserves to be heard and understood. Management can be an "idea killer" if it does not fully understand the true concept and falls into any of the false beliefs of loss of power, direction setting or leadership. The best performing management systems can be made ineffective if one concentrates on finding faults rather than motivating employees to excel. Organizations such as Wal-Mart have been successful in having the right product, at the right place, at the right time for the right price through the empowerment of its people......Are you the Wal-Mart of your field?

Foundational Qualities of Effective Leaders – A Different Perspective



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Capt Stephan T. Shardy currently serves as the Quality Advisor/Coordinator to the Commandant of the Air Force Officer Training School. Before this appointment, he was the OTS Leadership Studies Curriculum Area Manager and Lecturer--a position he held for nearly two years. Capt Shardy is a certified team leader and group facilitator, and serves as the OTS representative on the Air University Leadership and Management Program Advisory Group. He holds an undergraduate mathematics degree and an M.B.A. in Management.

FOUNDATIONAL QUALITIES OF EFFECTIVE LEADERS A DIFFERENT PERSPECTIVE

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ABSTRACT

This paper will present another perspective on leadership--one that looks from the 'bottom-up." It identifies a common thread in the fabric of effective leadership: attributes or traits that are critical to accomplishing the organizational mission, be it in the public or private sector. An effective leader is first an effective follower. By exhibiting the quality of dynamic subordinacy, the great leaders are better prepared for the servant-leader role. Here, one takes a deep, personal interest in the needs and welfare of others, and "rolls up the sleeves" with those he leads. With this foundation, the best leaders are principle-centered. Their reference point for decision making and mission accomplishment revolves around an "inside-out approach" to personal development and interpersonal relationships. Finally, great leaders are visionary. They set the pace for the organization by fostering an environment of teamwork and cooperation. The visionary leader provides solid direction and purpose-helping everyone find his or her unique roles and ultimate contribution to the mission.

INTRODUCTION

Leadership. Just the mention of that term conjures up the image of leather-bound volumes of books, articles, and treatises written by people from all walks of life. World leaders, military leaders, distinguished college professors, and CEOs of major (and sometimes minor) corporations have all put pen to paper on this popular and somewhat elusive topic.

So why should I even attempt to present my thoughts on leadership? After all, I'm not a well-known political leader or military expert. But that being the case, perhaps I nevertheless can share my perspective from personal observations of the leadership styles and behaviors of my past commanders and supervisors. I've experienced both effective and ineffective leadership. And this discussion outlines my views of what I consider to be the readily identifiable and foundational qualities of effective leaders.

If we accept the basic premise that leadership is the art of influencing and directing people to accomplish the given mission, then I would not be misfocused to say that there is more to leadership then merely barking out orders from a positional power base, or smiling while quoting leadership theory and practice. Although I do accept the limited importance of the personality approach (intelligence, competence, or special talents) to effective leadership, it nonetheless should play a minor role compared to one's character. And it's upon the basis of character we examine the leader as follower, as servant, as principle-centered, and as visionary. After all, in the midst of difficult decisions, I hope leaders would be able to bring more to the decision table than good looks and good talk. I hope you will agree.

DISCUSSION

In my opinion, the foundational quality of effective leadership is a thorough grasp of followership. After all, we are all accountable to someone else. In our lifetimes, we will spend more time taking orders than actually giving orders. Tragically, only a small fraction of the literature on leadership touches on effective followership. But, what I've read is good and appears to squarely hit the target.

In centuries past, a Roman consul so eloquently stated, "Commanders should be counseled, chiefly, by persons of known talents, by those who have made an art of war their particular study, and whose knowledge is derived from experience; from those who are present at the scene of action, who see the country, who see the enemy, who see the advantages that occasions offer, and who, like people embarked in the same ship, are sharers of the dangers" (Hughes 225). This speaks loud and clear of the impact subordinates can and should have in dealing with those in command. It speaks of a reciprocal agreement between leaders and those they lead. It speaks of listening and learning. Wise leaders do both.

This prepares us for perhaps the most distinct definition of effective followership. Followers "have the vision to see both the forest and the trees, the social capacity to work well with others, the strength of character to flourish without heroic status, the moral and psychological balance to pursue personal and corporate goals at no cost to either, and, above all, the desire to participate in a team effort for the accomplishment of some greater purpose" (Hughes 224).

This definition takes the best of followership out of the realm of merely displaying sheep-like qualities of passive, dependent, uncritical thinking, or actively carrying out orders uncritically. It also discredits those ineffective followers who merely survive with a "don't make waves" attitude, or those who seek to undermine the very goals, policies, and procedures of the organization. Yes, the best leaders exhibit the quality of dynamic subordinancy. They expertly blend their unquestionable personal integrity and loyalty with a thorough understanding of the organization, including their contribution. Then they wrap this with adaptability and versatility within a dynamic, changing environment (Lundin 20).

One of the key principles of Scripture, so masterfully exemplified in the lives of many biblical characters, is that whosoever aspires to be the greatest among men must first be the least. This point leads me to the second attribute of great leaders--a servant-like attitude. This attitude aligns beautifully with what we already discussed about followership.

The servant-leader gains the respect and admiration of his people by treating them with compassion and understanding, by active listening without judgment, by fostering an environment of trust where he is first found trustworthy, by recognizing and rewarding great performance without flattery, by setting the example of selflessness instead of selfishness. A servant-leader can be found in the "trenches"--developing and nurturing those interpersonal skills with the men and women who carry the load. Then he leads the charge into battle, forging the path to victory ahead of those same people.

Consider the example of General Viccellio, Commander of Air Education and Training Command. He wanted to clearly understand the challenges his people faced, and the best opportunity was found "in his backyard" - at the training grounds for all Air Force enlisted personnel. Disguising himself as a new recruit, he captured a glimpse of basic training from the barracks. He wanted to see what they see, to feel what they feel, and yes, to even clean latrines. When the full story emerged, one airman was overwhelmed by this senior leader's concern for his troops. He said he would never forget this lesson in servant-leadership (Widnall 35).

When a leader takes a deep, personal interest in the lives of his people, on and off the job, morale is high and people are motivated to do their best. But, when a leader doesn't care to meet the personal needs of the followers, morale plummets, motivation nose-dives, and the mission suffers. Only a fool would believe a mission can be accomplished without the support and allegiance of the people he or she serves. I've experienced organizations, first-hand, where those in charge would sacrifice their people, not for the mission (as they wanted others to believe), but for a vainglory power surge. Nobody wanted to be in their command.

However, I've been in others where the commander cared about, listened to, and worked alongside, not over the followers. He set the pace. We followed willingly--not because we necessarily had to, but because we wanted to. We recognized the leadership commitment and responded in kind. Perhaps our response to this quality of leadership mirrors that of the sailors who served in the command of the immortal British admiral, Lord Horatio Nelson. He had won the admiration and respect of his followers to an unusual degree because he honored and respected them as individuals. In one memorable instance, just after the admiral had improved the living conditions on ship, an anonymous note from the crew appeared on the quarter-deck: "Success attend Admiral Nelson. God bless Captain Miller. We thank them for the officers they have placed over us. We are happy and comfortable, and will shed every drop of blood in our veins to support them" (Newman 107) (italics mine).

Major General Aubrey "Red" Newman, USA (Retired) masterfully captured the essence of the servant-leader attitude. Listen to his comments about the "human touch" to leadership.

"Most of us are concerned about the turning points in our own lives. But every good soldier in authority should be just as concerned with his responsibility to help those under him make the right turns...It is easy to decide 'in the best interest of the service' where money and materials are involved. When men are concerned, however, commanders must be perceptive and alert to see the turning points for individuals. It's like finding four-leaf clovers; they're always there, but you must look for them. Otherwise you may crush them underfoot unaware" (Newman 63).

In my view, the most effective leaders reach and maintain the delicate balance between the mission and the most important resource to its accomplishment--people. Call it a quest. Call it fulfillment. Whatever label you give it, seek to possess it. That balance will most certainly preserve you in the midst of difficult leadership decisions. I believe you'll be in the minority--perhaps even marching to a different drummer.

The third attribute of great leadership is <u>principle-centered leadership</u>. And the one individual, in my opinion, who has set the pace, on a global scale, in the research and understanding of the dynamics of interpersonal relationships is Dr. Stephen R. Covey. He asserts that principle-centered leaders identify with and exhibit the Seven Habits. These habits of being proactive, beginning with the end in mind, putting first things first, thinking win-win, seeking first to understand then to be understood, synergizing, and sharpening the saw, move a person from a paradigm of dependence to one of interdependence. Sharpening the saw is the habit of self-renewal. You must renew yourself physically, emotionally, intellectually, and spiritually. The continuum from dependence to interdependence is a movement from "you didn't come through and I blame you for the results" to "we can cooperate and combine our gifts and talents for something better" (Habits 49). Principle-centered leaders clearly realize that before they can affect change in another person, they first must change. Their primary ethic is one of character, not personality. Everyone is blessed by their presence and positive contributions.

Principle-centered leaders cultivate a garden of cooperation, fairness, roles, and vision. They recognize the worth of each individual in the organization, and they know and understand the meaningful, worthwhile contributions each person can make when given a chance. They recognize that the talents of many far surpass those of one, and they foster a climate characterized by that synergy.

I believe these leaders are experts at the "vital-shift". As Covey states, "They continually seek to expand the areas over which their people could exercise self-direction and self-control as they develop and demonstrate better insight and ability" (Covey 180). As this transition from passive to active followership takes place, leaders can now uplift, fulfill, empower, and inspire. They can finally do what they were originally tasked--effectively accomplish the organizational mission! Everyone benefits. Everyone grows. Everyone is aligned with the vision.

This leads me to the fourth attribute of effective leaders. They are <u>visionary</u>. People with vision possess that unique ability to see beyond the present--the here and now. They are forward-thinking and constantly test the boundaries of contemporary thought and practice. They think "outside the box", but in such a way as not to lose their perspective on reality. They become the "paradigm busters" - constantly looking for better ways to do business. The visionary leaders despise the status quo and hate the "we've always done it that way" syndrome. They take action and challenge others to do likewise. In fact, the more you tell people of vision "can't", the more they pulsate "can" and "will" and "must".

Joel Barker's words shout loud and clear at all leaders, "Vision without action is merely a dream. Action without vision just passes the time. Vision with action can change the world" (Barker 1990).

When an organization finds itself going in the wrong direction or aiming at the wrong target, the best leaders can make things right again. Covey states,

"A strategic leader can provide direction and vision, motivate through love, and build a complementary team based on mutual respect if he is more effectiveness-minded than efficiency-minded, more concerned with direction and results than with methods, systems, and procedures. While all of the producers are hacking their way through the jungle and their managers are sharpening their machetes for them and setting up machete-welding working schedules and putting on training programs for machete welders, an enlightened and courageous leader must sometimes cry out, 'Wrong jungle!' even though he can expect to receive the answer, 'Be quiet! We're making progress' (Covey 249).

CONCLUSION

Are these four foundational qualities of effective leaders incongruent within the military or corporate environments? The question is answered with a resounding NO! To do less is a disgrace. It's not a popularity contest, but a higher calling to leadership excellence.

I believe tomorrow's leaders will face challenges that will make even the most courageous of people fainthearted and uncertain. But I also believe only those leaders who demonstrate <u>followership</u>, <u>servanthood</u>, <u>principle-centeredness</u>, and <u>vision</u> will ultimately win the race. And those of us privileged to be in their command will share in the victory.

WORKS CITED

Barker, J. A. <u>Discovering the Future Series: The Power of Vision</u>. Barnsville: Charthouse International Learning. 1990.

Covey, Stephen R. Principle-Centered Leadership. New York: Fireside. 1990.

---. The 7 Habits of Highly Effective People. New York: Fireside.1989.

Hughes, Richard L., Robert C. Ginnett, and Gordon J. Curphy. <u>Leadership--Enhancing the Lessons of Experience</u>. New York: Richard D. Irwin. 1993.

Lundin, Stephen C., and Lynne C. Lancaster. "Beyond Leadership...The Importance of Followership", <u>The Futurist.</u> 1990: 18-20.

Newman, Aubrey. Follow Me. Novato: Presidio Press. 1981.

Widnall, Sheila E., "Watch Your Character--It Becomes Your Destiny". Airman, April 1994: 35.

Groupware Technology for Air Force Quality Teams



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GROUPWARE TECHNOLOGY FOR AIR FORCE QUALITY TEAMS

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ABSTRACT

The Air Force (AF) uses quality teams to improve processes and solve problems. These teams provide the AF with a mechanism to improve the quality of its products and services. Groupware is an emerging technology geared toward helping people collaborate more effectively, productively, and creatively. This paper examines how groupware can be applied to help Air Force quality teams improve the efficiency and effectiveness of their meetings. If properly implemented, groupware could enable quality teams to provide the innovations and quality improvements that the AF needs during this post-cold war draw down period.

INTRODUCTION

In the late 1980s, the AF embarked on the road to quality by implementing aspects of Total Quality Management (TQM). Based heavily on the teachings of W. Edwards Deming and Joseph M. Juran, TQM is a collection of management methods that focus on customer satisfaction and involve continuous product and process improvement. More recently, the AF implemented its own quality program (Quality Air Force) to provide AF personnel with a common quality framework.

The <u>Quality Approach</u> pamphlet (1) emphasizes that "teams are an integral part of Quality Air Force." Accordingly, these quality teams increase the levels of trust, strengthen commitment, and improve the quality of decisions. Since their implementation, quality teams have improved processes in all of the AF's major commands from the squadron level all the way up to headquarters. These improvements have vastly improved customer service and saved the AF millions of dollars by redesigning or eliminating antiquated processes. General Merrill A. McPeak, the AF Chief of Staff, stated in a recent Quality Air Force (QAF) video (2) that "Teams are the key to quality and innovation."

During the same period that quality teams were being implemented throughout the AF, an exciting new technology commonly known as *groupware* was emerging. Fraase (3) defines groupware "as a group of technologies, techniques, and services designed to help people collaborate more effectively, productively, and creatively. Groupware can consist of hardware, software, services, and support."

The objective of this paper is to suggest how groupware can best be used to improve collaboration in AF quality teams. By properly implementing groupware technology, AF quality teams would have the means to more effectively improve processes AF-wide. The result would be higher quality products and services at a lower cost.

BACKGROUND

Process Action Teams

The quality ethos can be seen in AF quality teams such as Quality Councils, Strategic Planning Teams, Tiger Teams, Management Teams, QAF Criteria Evaluation Teams, Process Action Teams (PATs), and Integrated Process Teams (IPT). Let's look at one of these groups, PATs.

PATs are collaborative groups that focus on improving existing processes, solving problems, or developing new plans or procedures (1). As stated in the Air Force <u>Quality Approach</u> pamphlet (1), a

PAT consists of a team leader, a facilitator, and team members. The team leader provides direction and guidance to the team and makes sure the team's administrative functions are fulfilled. This includes meeting minutes, correspondence, charts, graphs, surveys, and other data related to the team's tasking. Also, the team leader traditionally represents the process owner. The facilitator's primary role is to focus on how decisions are reached, rather than what decisions are reached. The facilitator concentrates on team dynamics while the team leader focuses on content and the improvement process. Team members usually are involved in the process or have a vested interest in the outcome. The process owner is responsible for implementing and monitoring proposed recommendations.

PATs are usually chartered by senior management to address a specific process or problem area. Once formed, the PAT applies a problem-solving method similar to the FADE method (4) to look at the best way to improve the process or solve the problem. The FADE method, which stands for Focus, Analyze, Develop, and Execute, consists of four phases. First, the team focuses on a problem and describes it. Then, they obtain data and analyze it to learn about the problem. Next, they develop a solution and a plan to implement it. Finally, they execute the plan, monitor results, and adjust as needed.

PATs have undergone two process changes since their implementation. The original FADE problem-solving process changed to IDEA (Identify the process, Determine the most influential factors, Evaluate solutions, and Act on the Solutions), and then to the current seven step process (1): 1. Identify Improvement Opportunity, 2. Evaluate Process, 3. Analyze, 4. Take Action, 5. Study Results, 6. Standardize Solution, and 7. Plan for Future.

Group Interaction Techniques

Throughout the problem-solving process (whichever one is used), the PAT applies a variety of basic group interaction techniques to navigate through the phases. These techniques include: brainstorming, multivoting, cause and effect (fishbone) diagraming, innovation transfer, force-field analysis, flow charting, and several others. These techniques enable PATs to perform a variety of functions including gathering ideas, narrowing options, gathering and analyzing data, determining possible causes for a problem, and determining sequence of events. Unlike the recently developed problem-solving processes mentioned above, these group interaction techniques haven't changed much since they were first introduced in the 1940s. They are proven aids in the group problem-solving process.

Groupware Technology

Groupware technology in comparison to group interaction techniques is far from mature. According to Bostrom and others (5), the underlying concept for groupware had its beginning in 1965 with the development of Problem Statement Language/Problem Statement Analyzer (PSL/PSA). The PSL/PSA enabled individuals or groups to perform requirements analysis for information system design.

With the advent of personal computers and computer networks, groupware has expanded quickly and is used extensively by many companies today to support distributed business communications. Two of the more popular groupware products available in this arena are Lotus's cc:Mail and Notes programs.

One type of groupware specifically designed to support face-to-face problem solving is commonly called Group Support Systems (GSS) (6). According to Heminger (6), GSS are of very recent origin, with some of the earliest published papers on the subject dating from 1981. Heminger defines a Group Support System as a computer-based system, comprised of a facility, hardware, software, procedures and facilitation to support and augment the efforts of work groups to complete tasks. According to McLellan and Knupfer (7), GSS create a shared workspace that supports dynamic collaboration in a work group. They are designed to enhance the collection of new ideas, to improve feedback, and to encourage the participation of all work group members. Johansen (8) notes that GSS allows team members to work directly with computers for brainstorming and voting on subjects independently and autonomously. GSS

are also known as Group Decision Support Systems (GDSS), Computer-Supported Face-to-Face Meeting Groupware, or Same-time/same-place Groupware.

The first groupware meeting facility to employ GSS was at the University of Arizona in 1984 (6). This first facility, called the PlexCenter, housed a large U-shaped conference table with 16 computer workstations all tied to a file server with the groupware software resident. Only since 1989 has GSS technology become commercially available and only since 1993 has the DoD had facilities equipped with GSS.

According to Bostrom and others (5), GSS will catch the business world's attention in the 1990s. Bostrom believes the low-tech flip charts, whiteboards, and overhead projectors used in most conference rooms today will be replaced by GSS when businesses recognize their value. GSS provides several capabilities manual techniques can't, including a complete written record of what was agreed on during the meeting, anonymous discussions, simultaneous input of ideas, and fast voting or ranking of alternatives.

COLLABORATION AND GROUPWARE

As quoted earlier by Fraase (3), groupware systems are designed to help people collaborate more effectively, productively, and creatively. Collaboration as defined by Schrage (9) is "the process of shared creation. It occurs when two or more individuals with complementary skills interact to create a shared understanding that none had previously possessed or could have come to on their own."

Schrage explains that "collaboration is necessary for breakthroughs in science, the arts, and technology as well as for paradigm-shift quality advancements." Unfortunately, these breakthroughs occur with neither the frequency nor the intensity that we would like, in part because there are few tools explicitly designed to encourage or support collaboration. Bostrom and others (5) explain that groups are often perceived as inefficient and ineffective due to a lack of breakthroughs. They fail to use the full resources of their members due to process losses such as conflict and poor communications.

Heminger (6) and Nunamaker et al. (10) found that groupware and more specifically Group Support Systems (GSS) increase the effectiveness and efficiency of teams. GSS accomplishes this by supporting and enhancing beneficial group processes, while circumventing or minimizing many of the counterproductive aspects of group work.

DeSanctis and others (11) also found that GSS can enhance collaboration while minimizing conflict. Utilizing GSS, according to DeSanctis, affects teams in several key ways: "First, it enables teams to gather and explore multiple view points. Second, it provides structure when teams confront complex, unstructured decision tasks. Third, it helps to move the group forward when progress has stagnated. Fourth, it enhances meeting efficiency and fifth, it facilitates full participation and conflict management." Furthermore, DeSanctis adds that GSS offers teams the potential to reduce their effort in applying quality improvement methods by providing an automated means to enter, record, and operate on team members' ideas during face-to-face meetings.

Although groupware has been shown to enhance collaboration in teams, implementing groupware will not necessarily increase team efficiency and effectiveness. The team members will still need to be instructed and supervised in how to work together and on how best to use groupware and other techniques to achieve their goals. According to Gitlow and Gitlow (12), teams do not rely entirely upon groupware during a meeting but instead use features at various points during their discussions. Therefore, Gitlow believes educating members in team decision making and consensus building is important for group success. Team members need to know how to deal with power struggles within teams, how to communicate with the nonverbal team member as well as the attention seeking team member, how to develop team objectives and gain the benefits of teamwork, and how to resolve conflict

to move the team along in its stages of development. They also need a robust model to employ for designing and guiding their process (6).

GROUPWARE TOOLS FOR QUALITY TEAMS

Current Quality Team Tools

AF quality teams already employ several tools (some are considered groupware tools) to assist in team meetings. These tools include low-tech flip charts, whiteboards, chalkboards, post-it notes, overhead slide projectors, as well as medium-tech copyboards, and computerized overhead projectors. However, except for a few experimental occasions, they haven't used GSS or other high-tech groupware tools.

While the low-tech tools listed above do provide a shared and focused memory for a meeting, Stefik and others (13) explain that they provide limited space for input and they make rearranging items inconvenient due to manual redrawing. Also, handwriting can be illegible on this media. Finally, Stefik explains that information storage in this media is less than optimal. Chalkboards are unreliable due to erasing and information stored on flip charts can be cumbersome to carry around and can easily be damaged when taped on walls. If an issue requires several meetings to resolve as quality teams often do, there needs to be a more reliable and less cumbersome way to save information in the interim. GSS and other computer-supported groupware provide a reliable and easy-to-use medium for information storage.

The medium-tech tools (copyboards, computerized overhead projectors) provide capabilities beyond their low-tech cousins. According to Bostrom and others (5), "copyboards provide the ability to make a paper copy of whatever is written on the board or in some cases on a flip chart pad." Some of the more expensive copyboards also provide the ability to store information electronically. Likewise, computerized overhead projectors can provide an impressive platform for presentation support software. While these tools are useful, they can only assist teams in applying or displaying manual group interaction techniques. They don't provide an electronic medium for simultaneous and anonymous group interactions that is provided by computer-supported face-to-face groupware tools.

Group Support Systems

GSS, as previously stated, has the potential to vastly improve the efficiency and effectiveness of quality team meetings. KirkPatrick (14) believes Ventana Corp.'s GroupSystemsV is the most prominent of the GSS available. GroupSystemsV supports the major functions of group work including idea generation, idea organization, and decision making. It enables groups to brainstorm, vote on, comment on, and reorganize ideas and then store them electronically for future use or for hard copies. Also, it allows users to simultaneously and anonymously input data. KirkPatrick believes this software can dramatically speed progress toward consensus because people read faster than they speak, and because they don't have to wait for others to finish talking before inputting their views. A 1991 Boeing study supporting KirkPatrick's theory found that GroupSystemsV could shorten the time it takes groups to complete projects by as much as 90% (14).

A disadvantage to utilizing GroupSystemsV and other GSS for quality teams is that they use group problem-solving techniques that are slightly different from the ones currently used. For instance the brainstorming technique in GroupSystemsV obtains and stores ideas in a different way than the brainstorming technique currently used by quality teams. This problem could be overcome by training quality team members to use the new techniques or by designing and developing a GSS specifically for quality team usage. The latter option would contain large up front costs but may lead to a large increase in quality team efficiency and effectiveness with little or no training requirements for team usage.

Interactive Video Whiteboards

Another computer-supported groupware technology with the potential to radically increase productivity in quality teams are interactive video whiteboards. Video whiteboards according to Brittan (15) can be described as "a high tech version of shadow puppet theater." They are electronic screens that users can write notes and draw diagrams on just like a traditional whiteboard (or blackboard). Although not considered by most to be a Group Support System, the more recent video whiteboard systems provide many of the same capabilities provided by GSS such as simultaneous input and electronic data storage. One of the best of these products, according to Rooney (16), is Microsoft Corp.'s Whiteboard. Besides enabling multiple users to work on the same document or drawing simultaneously, Whiteboard also features a number of other capabilities, including paintbrush control, drag-and-drop cursor control, and Object Linking and Embedding (OLE). Whiteboard is scheduled to be available commercially sometime this summer (1994). Other real-time whiteboard software products available commercially include: Future Labs' TalkShow, Xerox Corp.'s LiveBoard, Fujitsu Networks Industry Inc.'s DeskTop Conferencing, and Ventana's Team Graphics (16).

An advantage for using interactive video whiteboards is that they can support the techniques currently used by quality teams. Using these whiteboards, the same brainstorming, voting, and diagramming techniques currently used by quality teams can be used more interactively and at a faster rate then when the techniques are performed manually. Another advantage to using whiteboards is they can be used to display and manipulate graphical as well as textual data. Current GSS process only textual data and have limited capability to display graphical representations of this data.

One disadvantage to interactive video whiteboards is that they don't provide users with a large degree of anonymity. Users may be able to determine who is operating other cursors. Also, depending on which system is purchased, cost could be another disadvantage. Xerox Corp.'s LiveBoard (LAN version) sells for approximately \$40,000 while Ventana's Team Graphics sells for about \$3500. However, prices for these systems are likely to drop as technology matures and competition increases and price will become a less deciding factor.

Implementation Strategies

Recent advances in technology as noted above are making computer-supported groupware tools a viable option for quality teams. Groupware capabilities will continue to improve while their costs decline. But still the cost to develop and run a dedicated groupware facility is beyond the fiscal capabilities of many AF organizations. With this in mind there are still several options available for quality teams to use this technology. Each major AF installation could develop a facility and have its wing or headquarter's QAF office run it. As a minimum, the facility would require at least one experienced facilitator and one trained groupware (information systems) technician. If your organization is on a small installation, there are still other options available. Some AF installations may have a portable facility that could be brought in for a small fee or if an installation with a facility is within driving distance, a TDY by your team to the facility may be cost effective. Finally, there may be civilian off-site installations or vendor-supplied portable systems which quality teams could use.

Future Groupware Tools

In the next few years, groupware technology will become more powerful and easier to use (8). Johansen (8) believes that artificial intelligence will be the single most important technical contributor to groupware growth. It will lead to the development of groupware software that is at once easier to use and more powerful than applications available today. Some of this future technology could be used by quality teams as process advisors, interaction trackers, translators, and intelligent computer interfaces.

AN EXAMPLE OF GSS EFFECTIVENESS - GRLL RESEARCH PROGRAM

On 1 February 1993, the Logistics Research Division of the Armstrong Laboratory (AL/HRGA), at Wright-Patterson Air Force Base opened a groupware facility called the Group Research Laboratory for Logistics (GRLL). The GRLL was created to develop and explore groupware technology for use in AF acquisition and logistics organizations. According to researchers at the laboratory (17), the GRLL is a dedicated groupware facility with 15 computer workstations dispersed around a U-shaped conference table and all tied to a file server with several resident GSS. Also, the facility has specialized air conditioning and lighting, comfortable seating, a large public screen, white boards, and other ergonomically designed features to improve team interaction.

Through the first ten months of use, the researchers conducted 117 group sessions (including quality team meetings) in the GRLL. Laboratory personnel provided process facilitation as well as technical guidance on using resident GSS during these sessions. Team compositions ranged anywhere from 3 to 30 (2 per workstation) members. Most of the teams were tasked to perform management planning activities such as developing goals, mission statements, visions, and metrics. The teams usually had an assigned team leader to provide direction and guidance. The team leader worked closely with the researchers to preplan the meetings and to make impromptu adjustments to the plan during the sessions.

GroupSystemsV, the GSS recommended by KirkPatrick (14), provided most of the group interaction and problem-solving techniques used during these sessions. GroupSystemsV is a product of the Ventana Corp. of Tucson, Arizona and sells for about \$25,000 for 20 users. This program is DOS-based (there currently is a Windows-based version under development) and runs on most LANs (17). This commercial grade software supports the major functions of group work including anonymous idea generation, idea organization, and decision making. The GroupSystemsV program is also used at two other DoD groupware facilities: the Navy Yard in Washington, D.C., and the Army's Redstone Arsenal in Huntsville, Alabama.

The GRLL sessions were for the most part very successful (17). Data collected from participants using a post-session questionnaire (Figure 1) shows most participants felt the GSS along with the facilitation provided by the researchers significantly helped the groups with their processes. This hypothesis was also supported by several user-proclaimed successes. One of these successes occurred recently when 15 senior leadership members from the Aeronautical System Center (ASC) used the GRLL to develop ASC core values. The results of the one-day GRLL session prompted Lt. Gen. James A. Fain, Jr. (HQ ASC/CC) to state that the product developed during the session "exceeded my wildest expectations" (18).

Post Session Participant Assessment of GRLL Sessions						
	n= 168	strongly disagree	disagree	not sure	agree	strongly agree
1	GSS system helped our process.	7.3	11.7	19.7	38.7	22.6
2	GSS system helped us reach our goals.	0.6	1.8	17.3	67.3	13.1
3	Would be more valuable if distributed.	0.6	3.6	24.4	39.9	31.5
4	Facilitation was very helpful.	1.2	7.7	11.3	46.4	33.3
5	GSS has been an obstacle to our process.	34.1	49.7	11.9	3.6	0.6
6	I would choose to use the system again.	1.7	4.8	17.9	44.6	30.9

Figure 1 (17)

Successful team meetings, according to Heminger (17), require good facilitation to complement a GSS system. Heminger stated that "facilitators are still very important to the GSS process and that GSS should be seen as a good set of tools for a good facilitator, not a replacement for the facilitator." The data collected from the post-session questionnaire supports that assertion.

CONCLUSION

Groupware provides a unique opportunity for group interaction and process improvement in the AF. The AF recently implemented a quality program known as Quality Air Force (QAF) to improve the quality of its products and to improve customer satisfaction. A major thrust of this initiative is to use quality teams to improve processes and solve problems.

Groupware is a group of technologies, techniques, and services designed to help members of quality teams collaborate more effectively, productively, and creatively (3). When properly implemented, they increase the efficiency and effectiveness of team meetings. Research at the Group Research Laboratory for Logistics (GRLL) found that participants viewed groupware (more specifically Group Support Systems (GSS)) as a valuable tool for their group interaction process. The data also suggested that GSS should be used in concert with a good facilitator, not as a replacement for the facilitator.

Currently, AF quality teams employ several tools and techniques to assist in team meetings. However, very few of the teams have used computer-supported groupware tools. Recent advances in technology are making these groupware tools a viable option for quality teams. Two potential computer-supported groupware tools (GSS and multiple-user interactive whiteboards) were examined in this paper for possible implementation in AF quality teams. With proper training and good facilitation, these tools have the potential to vastly improve the efficiency and effectiveness of quality team meetings.

GSS provide automated decision aids and brainstorming techniques to improve group problem solving. Bostrom and others (5) found that GSS provided several capabilities not available through manual group interaction techniques including a written record of what was agreed on during the meeting, anonymous discussions, simultaneous input of ideas, and fast voting or ranking of alternatives. "The demonstrated benefits of GSS," according to Heminger (6), "include shorter meeting times, more productive meetings, increased participant satisfaction, reduced project completion time, larger solution sets from which to develop possible solutions, opportunities for innovative problem solutions, increased buy-in by participants to the problem solution, and increased awareness of decision making rationale."

Interactive video whiteboads allow multiple users to input data simultaneously by utilizing multiple cursors on the 'whiteboard' screen. One advantage these whiteboards have over GSS is the capability for quality teams to use their current group interaction techniques in a more interactive way. Also, they offer the ability to manipulate graphical as well as textual data. A disadvantage is they don't ensure anonymity to the users.

In the next few years groupware technology will become even more enticing for AF quality teams. The AF will need to rely more on quality teams to provide the innovations and quality improvements that will be necessary during this post-cold war draw down period. In addition, the AF will be performing more activities requiring teams including: implementing new technologies, re-engineering business processes, and consolidating organizations.

REFERENCES

- (1) The Quality Approach, Air Force Quality Center, Maxwell AFB, Alabama, 1993.
- (2) McPeak, Merrill A. Quality Air Force (QAF) Video. Air Force Quality Center, Maxwell AFB, Alabama, 1993.
- (3) Fraase, M. Groupware for the Macintosh: A Complete Guide to Collaborative Computing, Homewood, Illinois: Business One Computing, 1991.
- (4) Quality Action Teams, Organizational Dynamics, Inc. (ODI), Burlington, Massachusetts, 1990.
- (5) Bostrom, Robert P., Watson, Richard T., and Kinney, Susan T. Computer Augmented Teamwork: A Guided Tour, New York: Van Nostrand Reinhold, 1992.
- (6) Heminger, A. R. "Assessment of a Group Decision Support System in a Field Setting." Doctoral dissertation, The University of Arizona, 1989.
- (7) McLellan, Hilary, and Knupfer, Nancy Nelson. "Virtual Collaboration via Groupware." <u>Multimedia</u> Review, Vol 4 No.1 (Spring 1993), pp.24-31.
- (8) Johansen, Robert. <u>Groupware: Computer Support for Business Teams</u>, New York: The Free Press, 1988.
- (9) Schrage, Michael. Shared Minds: The New Technologies of Collaboration, New York: Random House, 1991.
- (10) Nunamaker, J. F. Jr., Vogel, D. R., and Konsynski, B.R. "Interaction of Task and Technology to Support Large Groups." <u>Journal of DSS</u>, 1989.
- (11) DeSanctis, Gerardine, et al. "Using Computing to Facilitate the Quality Improvement Process: The IRS-Minnesota Project." Interfaces, Vol 21:6 (November-December 1991), pp. 23-36.
- (12) Gitlow, Howard S. and Gitlow, Shelly J. <u>The Deming Guide to Quality and Competitive Position</u>, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1987.
- (13) Stefik, Mark, et al. "Beyond the Chalkboard: Computer Support for Collaboration and Problem Solving in Meetings." Communications of the ACM, Vol 30 No. 1 (January 1987), pp. 32-47.
- (14) KirkPatrick, David. "Groupware Goes Boom." Fortune, (December 27, 1993), pp. 99-106.
- (15) Brittan, D. "Being There: The Promise of Multimedia Communications." <u>Technology Review</u>, Vol 95 No. 4 (1992), pp. 42-51.
- (16) Rooney, Paula. "Microsoft preps 'Whiteboard'; Conference Software Lets Remote PC Users Edit Simultaneously." PC Week, Vol 10 No. 33 (August 23, 1993), pp. 8.
- (17) Heminger et al, "Creating the Group Research Laboratory for Logistics (GRLL) at AL/HRGA." Unpublished research paper, Logistics Research Division, Armstrong Laboratory, Wright-Patterson AFB, Ohio, 1994.
- (18) Fain, James A., Jr., Lt. Gen. Personal Comment. Logistics Research Division, Armstrong Laboratory, Wright-Patterson AFB, Ohio, 1994.

Leadership for Quality Air Force



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LEADERSHIP FOR QUALITY AIR FORCE

Abstract

This presentation analyzes a framework for leadership within the context of a quality Air Force. It builds on the premise that leadership is an essential element in achieving Air Force quality. This paper is a statement of principles, illustrated by concepts, providing a frame of reference for developing leadership skills to enhance organizational quality. It will overview the value and demonstrated importance of leadership for total quality. Without leadership, there can be no significant institutional quality. Organizations in the process of implementing value-added, constructive changes within today's highly competitive Air Force environment, will immediately recognize the value of leadership at every organizational level. This presentation is designed to sharpen the ability of individuals to lead more effectively in establishing and maintaining quality-driven organizations.

What kind of leadership is appropriate for a quality Air Force? What is quality leadership? On balance, there are usually two kinds of people in organizations: the movers and shakers and those that get moved and shaken. Quality leaders can best be characterized as the former. Leaders fully committed to achieving more and better organizational quality are clearly not ambivalent. They make things happen, challenge the status quo, and shake things up. Quality leaders offer a simple, fluent appeal to continuous improvement. They inspire their people to continue the race, even though there is no finish line. The most effective leaders in the quality movement such as Bob Galvin, Chairman of the Executive Committee of Motorola, Inc., (Malcolm Baldrige winner), whom this writer recently met, are great simplifiers, who have the capacity to defuse argument, cut prolonged debate, ease doubt and offer quality solutions that people can embrace and relate to. The quality leader should have a distinct personal image. This implies the ability to project a firm commitment to quality progress. Leaders in the pursuit of quality focus on defining goals in simple terms so that people can believe that quality is important and attainable. Effective quality leaders have the capacity to convince followers that they are taking part in the making of something that transcends their importance.

The current status of Air Force quality is one of hope and promise; therefore, leadership must ensure that it does not eventually turn into disillusionment and despair. This can best be achieved through an on-going involvement with the challenges that the achievement of quality offers. Although leaders set the direction, the quality momentum in the Air Force must be persistent and measured and built by individuals who believe that they can unite around a philosophy and practice aimed at making a good Air Force better. What is needed today is a heightened moral commitment to bring about value-added changes to carry the Air Force into the twenty-first century.

Leadership for quality Air Force is not as concerned about power as it is with empowerment. Quality leaders understand that the extent to which the work force is

empowered will largely determine how well organizations succeed. The concept of empowerment is deeply rooted in quality. Warren Bennis is right: "Empowerment is the collective effect of leadership." Leadership for quality Air Force emphasizes the building of balanced work teams of responsible players who work effectively together. Quality leaders encourage their people to support each other and share a "can do" collective pattern of quality behavior. Thus, this type of leadership promotes building cohesive and focused teams to enhance unit performance.

As the central figure in any quality effort, the success of leaders must be measured by their ability to motivate, support, train, give constructive feedback, and reward performance. Quality leaders in the current Air Force environment directly influence their people to achieve value-added excellence. My observations of commanders, particularly those attending the College for Professional Development, Commanders' School, suggest that quality leaders foster methods to ensure exceptional performance from average people. They focus on how to reenergize people so as to ignite the kind of fire and enthusiasm that enables productivity to flourish. These commanders have repeatedly made the point that leadership is the key factor in determining which organizations succeed or fail.

Quality leaders syndicate leadership throughout an organization. They communicate. set clear goals, and define objectives, and make certain they are understood. They focus on putting the right people in the right job, doing the right things for the right reasons. They then carefully instruct these members to follow the same process in their units, thus creating purposeful leadership throughout the system. And, during this entire procedure, the leader serves as a positive role model. This is accomplished largely by being active. staying in touch, learning from one's mistakes, having a basic value system, knowing how to communicate clearly, knowing their job, knowing their boss's job and making it easier for the boss to accomplish the mission. And, as General Russell E. Dougherty has said, "have fun." These quality leadership practices help to explain organizational success. The results can often be seen in empowered personnel, rewarding collective team as well as individual achievements, improved communications, and securing commitment to continuous change from all parts of the organization. In accomplishing these results. quality leaders influence others not by making them do something but by making them want to do it; not by telling people what to do but by telling them why it's important. These leaders have the unique capacity to communicate a compelling vision, one that others want to make happen. Knowledge alone is not enough to cause these things to happen. If this were true, the libraries would rule the world. What counts is leaders, with knowledge, who can make quality work for them. This aspect of leadership must be coupled with a leader's credibility and trustworthiness. This is a key factor in subordinates' judgment of an effective leader.

In this new post-heroic, quality leadership environment, characterized by empowerment, excellence, and transformationalism, the difference between leadership and management is taking on a new and important meaning. It has been said that people do not really want to be managed. They want to be led. Whoever heard of a world manager? World leader, yes; educational leader; political leader; scout leader; religious leader; business leader; quality leader; they lead. They do not manage. You can lead a horse to water, but you cannot manage it to drink. Both leadership and management are crucial to

achieve quality; but, they differ significantly. A key element here is that effective leadership is an unnatural act; and, to do it right, one has to learn two simple things: develop an understanding of what leadership really is, and then recognize when one is leading and when one is not. Some organizations are being micro-managed into the ground, by well meaning authorities who are doing their jobs the best way they know how. Since there is a critical difference between leadership and management in achieving quality, a comparison of leaders and managers is appropriate. Thus, within this context, it can be said that quality leadership and management are neither synonymous nor interchangeable: they are coequal in importance, not substitutes for one another. But there are important differences and distinctions between these two behaviors.

Field Marshal Sir William Slim, who led the British Army in the reconquest of Burma from the Japanese in one of the epic campaigns of World War II, recognized this difference and distinction when he said, "...managers are necessary; leaders are essential." Slim added that "...leadership is of the spirit, compounded of personality and vision,... management is of the mind, more a matter of accurate calculation, statistics, methods, time tables, and routine..." In effect, this distinguished soldier maintained that leadership (spirit, personality, vision) is an affective concept; management (mind, calculation, routine) is a cognitive concept. The modern military could give more attention to this important distinction.

Proliferation of management techniques in the business world and increasing demands for management expertise in the military profession have confused many Air Force members with respect to the relationship between leadership and management. The quality movement recognizes the need for skilled managers, but suggests we need to focus more sharply on effective leadership qualities.

In essence, management is the activity that allocates and utilizes resources to achieve organizational goals. Leadership is the art of influencing people to accomplish the mission. Leaders are more concerned with effectiveness, foresight, and innovation, doing the right things. Managers are more interested in efficiency, current issues, doing things right. While managers work in the system, leaders work on the system. Leaders use emotional and spiritual resources: values, commitment, and aspirations. Managers are more prone to employ physical resources of the organization: money, human skills, technology, and raw materials. These two concepts, which are not independent but interdependent, can be further differentiated so as to be better understood in order to achieve higher levels of quality within the Air Force. Management involves planning, organizing, staffing, controlling and problem solving. These processes cause and produce organizational stability. For this reason, management can be characterized as a set of specific activities such as hiring a new employee to fill an existing position, defining required skill requirements for various positions, and ensuring the availability of physical resources required to ensure the efficient operation of any quality activity. Contrarily, leadership sets direction, creates visions and values; it motivates and inspires people to change the culture of an organization. Leaders light the way to the future and encourage people to achieve excellence. They model values based on principles. While leaders formulate, managers implement. Leaders have the capacity to lift the spirit of people and get organizations moving in new, more effective directions. Conceptually, leadership involves ideas about what to do rather than how to do things. It bridges the gap between

the present and the future and displays a keen imagination as it projects an institution's future.

Quality leaders provide the staying power to see a vision to its completion. They focus with the intensity of a laser and they do not allow anyone to place limitations on them. They clearly sight their targets, especially in matters related to quality. Within this context, leadership is a highly personal activity. It deals principally with people. The creative quality leader is a risk taker and generalist--always searching for what is right and encouraging and welcoming change. Conversely, management is more impersonal. It deals largely with things and quantitative measures; the marshaling of required physical resources and the control of activities required to attain the purpose of an organization.

Although management and leadership differ fundamentally, they are both required in the pursuit of human accomplishment and continuous improvement. This analysis highlighting the leadership/management difference is not intended to suggest in any way that quality Air Force does not need managers. It needs both leaders and managers. They simply perform different functions in achieving quality. The Air Force requires responsible leaders and managers at all levels, who are willing and able to perform both of these behaviors equally well to achieve the high levels of quality desired.

Leadership and management go hand in hand; they are both important. When practiced together, they provide the foundation from which the Air Force draws its inspiration, its capability, and ultimately both its efficiency and effectiveness. The Air Force professional must be both a manager and leader. But it begins with the leader creating and articulating a vision of what the organization could achieve in the long run. Leadership for quality Air Force is what will move the Air Force in new directions and achieve the emotional and spiritual aspects of the quality organization.

Works Cited

Bennis, Warren. "The 4 Competencies of Leadership," <u>Training and Development Journal</u>, August 1984.

Brelin, Harvey K. "The Role of Leadership In Total Quality Improvement," <u>Continuous Journey</u>, December 1993/January 1994.

Dougherty, General Russell E., USAF Retired. Personal Interview, 20 May 1993.

Hickman, Craig R. A Manager's Mind, Soul of A Leader. New York: Wiley, 1990.

Hogan, Robert, et al., "What We know About Leadership," American Psychologist, June 1994.

Huey, John. "The New Post-Heroic Leadership," Fortune, February 1994.

Kotter, John P. A Force for Change. New York: Free Press, 1990.

Timpe, Dale A. Leadership. New York: Facts on File Publication, 1987.

Willis, Garry. "What Makes A Good Leader," The Atlantic Monthly, April 1994.

Zenger, J. H. et al., Leading Teams. New York: Irwin, 1994.

Recognizing Teams – Your Next Priority!



Lt Col Kelly Kemp

MS Systems Management - University of Southern California, 1982 BS Management - United States Air Force Academy, 1974

Currently the Director of Intelligence Networking for Electronic Systems Center (AFMC), Lt Col Kemp is responsible for team building and training of multiple government and contractor integrated teams dedicated to installing Intel comm-computer systems to satisfy the needs of both the Dept. of Defense and Dept. of Justice agencies. Current teams include Combat Intel Systems for our joint war fighters and Counter-Drug Intel Systems for agents and analysts waging the war against illegal drug use. Previous team building scenarios included Space Systems Center's Titan Launch Vehicle and Consolidated Space Operations Center programs. Kelly was formerly Head Coach of both the AFA Men's and Women's Swimming Teams and USA National Junior Women's Water Polo Team.

RECOGNIZING TEAMS --

YOUR NEXT PRIORITY!

Kelly Kemp, Lt Col, USAF Electronic Systems Center (AFMC)

Abstract - This paper discusses award concepts and presents an initiative on cooperative Quality Team Awards, which is a win-win strategy of recognizing all teams for the improvements a specific organization wishes to see. The recognition system explained and documented accentuates each Team striving toward improvement vice competition against other Teams, which is often perceived as a win-lose scenario. These awards are targeted for organizations with Teams in an initial or early development state, but have smooth transition to full operation. As such, they dovetail into not only the Air Force's Team Quality Award (TQA), but also other government/industry Team recognition and reward systems.

As a leader, dedicated to individual, team and organizational development, one must first ask a fundamental question: "What behavior or behaviors do I want to improve?"

Once you've answered this issue, then decide on an award mechanism that both recognizes that behavior and paves the way toward future development and continuous improvement.

After tackling the behavioral issue and sharing it with our Quality Steering Group (QSG), we came up with a simple focus, and that was to incentivize <u>TEAMS</u>, not individuals. Quality Teams should be the norm, we surmised -- and Quality Teams would be endorsed by our leader. Our QSG would, under its charter "to facilitate and encourage improvements for the intelligence community," be the cheerleaders and trainers. Besides, as our leader has said many times, "Let's raise the bar" and constantly strive for excellence. Why not "raise the bar" for a Team vice an individual? In a way, it's like having the whole track team perform the high jump together, each member pulling for one another.

Both in public and private sectors -- government and industry -- there are numerous individual awards and recognition programs, but very few Team awards and recognition programs. Here's one that you, in your role as leader, coach, mentor, facilitator could put into effect immediately. We did it to improve government and industry relationships, specifically in the military acquisition business with its contractors, but you could use it in any Teaming scenario. Here's the basic definition:

OUTSTANDING QUALITY TEAM - Continuous Improvement (CI) Teams, either military, civilian, joint or combined, who have synergistically come together for team building, problem identification, action planning and resolution, and/or process understanding and improvement, and have shown significant achievement -- all in the spirit of open communication, honesty, trust and teamwork.

One word of caution -- we most certainly didn't want to bypass individual awards programs that were deeply rooted within the organization. There continues to be an ingrown need for personal motivation, as discussed in many writings, such as cash awards, merit awards, time off, promotions, etc. Due to the large amount and variety of individual rewards and recognition available, and the lack of substantial Team recognition (at the time), we did a quick force field analysis of the individual ones available to avoid as many negatives as possible. The following is a listing of those negatives:

- write ups have to be perfect
- many inconsistencies in interpretation
- write ups are too time consuming
- too tight suspense or deadline
- write ups have to many bureaucracies to go through
- levels of review force a win-lose
- each level is more tightly constrained
- no second place; only one winner
- competition is a killer
- sometimes only annually announced
- often no repeat winners (removed from future consideration, either stated or implied)

From that listing, we come up with a generic list of positives. The net effect was to try to lay the ground work for Team awards being more valuable in their intrinsic worth than past history has shown of some individual awards. Here's a recap of the positive desired outcomes:

- win-win
- cooperative
- multiple nomination sources
- easy form/format
- anytime submittal only one review/judgement
- prompt recognition
- able to upgrade or requalify as soon as appropriate

So far, the desired outcomes sound great, but are they achievable? Yes! They are achievable, and our QSG not only took on Quality Team Awards with zeal, but continue to sponsor this program with success. Rapid communication and documentation are important ingredients to that success.

We put everything on an electronic database, so we could transfer files with ease, for speed of review, understanding and update. First was our data page to maintain consistency of information:

TEAM DEFINITIONS - Teams can be either functional product/process or integrated product/process oriented, i.e., there are no restrictions: the following all qualify:

Integrated Product Teams or Integrated Program Teams (IPTs)

Integrated Product Development Teams (IPDTs)

Process Action Teams (PATs) or Process Improvement Teams (PITs)

Steering Groups (SGs) or Leadership Councils (LCs) etc., (both Executive or Senior level)

Tiger Teams for limited short term duration or Crisis Action Teams (CATs)

Working Groups (WGs) or long range committees evolving to cross-functional Teams

AWARD ELEMENTS

COOPERATIVE - The change in culture for these Awards is that the philosophy is cooperative in nature vice competitive. There is no ceiling number of Award winners in each category.

Your Quality Award PROCESS OWNER - Quality Steering Group (QSG) (or similar forum)

AWARD PROCESS

SUBMITTALS - Any individual may submit any Team for any category at any time. Those nominations must follow the format in Illustration 1 for ease of review and proper recognition. Use bullets in the narrative. See Illustration 2 as an example. Submit to any member of the QSG. Awards may be retroactive if the need exists, but accomplishments and improvements should be tracked at least quarterly to give as immediate as possible feedback to each Team.

ESC/IC QUALITY TEAM AWARD NOMINATION DATE: **QUARTER:** NOMINATOR: **ORGANIZATION:** Address: TEAM NAME: **ORGANIZATION: TEAM MEMBERS NAMES:** (spelled correctly) Short NARRATIVE: or Bulletized ACCOMPLISHMENTS: (preferred)

Illustration 1

CALL FOR NOMINATIONS - There will be a call for in-cycle recognition at the start of the third month of each quarter. This event is set to allow those folks that need it a friendly push or a routine calendar event to render new input. Approximately two work weeks (10 working days) will be available for initial draft, mid-course polish and final submittal; and then one week for electronic distribution and review by the QSG. The leader is then notified of the Teams by name, membership, mission and success. He/she reviews each Nomination as certified by the QSG and becomes familiar with the facts to illustrate and verbalize Team achievement and improvement at a public forum.

ESC/IC QUALITY TEAM AWARD

NOMINATION

DATE: May 1993

QUARTER: 3FY93

NOMINATOR:

Kelly Kemp

phone 7297

ORGANIZATION:

ESC/ICD

Hanscom AFB, MA 01731

TEAM NAME (NOMINEE):

Counter Narcotics Intel Systems Team

(Combined Government/Industry IPT)

ORGANIZATION:

ESC/ICDC

TEAM MEMBERS NAMES: Linda Jean

Brian Ballard
Joe Delaney
Dick Heslin

Bill Mason Maria Saviano

Bernie Boucek

Jack Flaherty Dave Hart

Nate Sprague Dave Lyons

NARRATIVE: This team first formed in December 92 under the banner of the National Drug Intel Center (NDIC) for strategic planning purposes. In the January through February 93 time frame, the team expanded to include all Counter Narcotics (CN) Intelligence Systems, being worked primarily via NETCAP, but including all other ways and means to meet and Exceed the User's Needs. During March, the CN Team volunteered to act as the PILOT PROGRAM for IC TEAM TRAINING -- and what has evolved in subsequent months is a continuing mission and need to satisfy multiple Government Agencies

- Meeting management observed
 - -- Groundrules listed and followed
 - -- Expectations listed and communicated
 - -- Agendas utilized; included daily feedback
- Purpose statements defined and used at each subsequent session
 - -- CN Team purpose
 - -- IC Team Training (generic draft) Purpose
- Followed through with four 2-hour sessions to establish core curriculum:
 - -- Vision aligning/paradigm shifting/strategic planning
 - -- Inclusion Techniques
 - -- Problem Identification: Listed and prioritized multiple CN problems
 - -- Process Understanding: Brainstormed critical processes

Illustration 2

REVIEW CRITERIA and LEVELS - The QSG, in team forum, will review and allocate each nomination, by category, as objectively as possible into one of three Levels:

LEVEL I - "Entry" Level

LEVEL II - "In Work" Level

LEVEL III - "Completion" Level

All submittals, as deemed worthy by the QSG by meeting criteria, will be certified as winners.

AWARDS - All certified nominations will be announced as Award winners. Each individual winner and each member of a winning team will receive a computer generated certificate with the appropriate category and level. An example of a low cost, clearly tailored and meaningful certificate is shown at Illustration 3.



IC QUALITY TEAM AWARD

CERTIFICATE OF COMMENDATION

Presented to

SENTINEL BYTE/INTELLIGENCE CORRELATION MODULE TEAM

Jackie Yeaney

Dave Lambert

Charlie Bobbish

Cathy Bettencourt

Joel Camiel

Allen Biggs

Steve Swane

Kimbly Madden

for accomplishments in attaining

LEVELITEAM

Special recognition for improving the Software Configuration Management process through Problem Definition & Analysis, Process Development & Documentation and planning for Process Institutionalization and further Improvement

Second Quarter, FY93

HARRY E.MROZOWSKI, Colonel, USA

System Program Director

Intelligence & C3CM Systems

Chairperson

IC Quality Steering Group

Illustration 3

Next is to personalize that recognition at your Commander's Call, with a presentation by your leader. We do it at our Quarterly all-hands call. Further recognition is to publish Teams and members in your weekly town newspaper and quarterly (or monthly) Quality Newsletter.

But let's pause a moment to discuss the "Levels" and your Team's "worthiness to 'Achieve a Level' or 'Proceed to the next Level.'" As for "worthiness," the Team above (Illustration 3), when submitting their one-page Nomination form filled in, also sent in their mission statement, charter, group meeting rules, fishbone diagram of problems and root causes, problem definitions, and a current flow chart of their software configuration management process. This ICM Team clearly showed the "In work" phase, with a strong lead into charting their future process, capturing metrics and doing work toward "Completion." Even with a reorganization under the new Combat Intelligence Systems and

inclusion of new partners Air Combat Command and Air Intelligence Agency, this Team could requalify at Level II and continue to improve toward Level III. The CN Team shown earlier (Illustration 2), provided purpose statements, prioritized problems and initial process listings with their Nom. As you will see below, they completed most "Entry" activities. The CN Team was recognized at Level 1.

As for "Levels," this is where some work needs to be done by your QSG, guidance group or leadership council. You must determine those criteria and sub-criteria and affinity them to major categories and Levels. Three may not be the "right answer" for you -- maybe two -- maybe more. But our lesson learned is that, given this tool, your group will gain buy-in through the brainstorming and affinity of these criteria. Our sample is at illustration 4.

OUTSTANDING QUALITY TEAMS -

Sequenced Criteria

Entry/Initiation LEVEL I

Problem Identification

Surface and Identify Problem(s)
Understand Problem
Define Problem Statement(s)
Prioritize Problems
List key or critical Problems
Draft & understand Impact Statements
Draft team Action Plans & Initiate
Ownership

Goals & Objectives

Define Team Goals & Objectives Form goals & objectives Prioritized Goals & Objectives Identify & schedule plan

Communication

Top-down mgt level commitment Share information Promote cross-communication Promote cooperation Bottom-up worker level suggestion program

Team Building

Identify Need for PAT/team
Team Member Assignments
Analyze team assets
Formation
Chartering
Encourage Team Concepts

Team Training

TQ Concepts
Linkage of Vision
Meeting Management
Members participative
TQ Tools
Team Inclusion Theory
Definitions

In Work/In Process LEVEL II

Process Understanding

Work toward process improvement Identify critical/key processes Utilize concepts/tools for process improvements Prioritize critical processes Flowchart a process

Problem Resolution

Measures/metrics in use

Work toward problem resolution Review problems and issues Prioritize actions Took action to implement improvement Continue ownership Actively work action plans Utilized or utilizing TQ tools/techniques Review/make corrections

Goals & Objectives

Work toward goal attainment Construct process improvement plan Implement process improvement Prioritize actions Actively work action plans

Communication

Document and share PAT/team Charter Use team meeting tools to follow-up Publicize TQ participation Discuss team change as situation changes

Team Strengthening

Participate with customers/users
Include all members in decision making
Constantly and consistently
promote team cooperation
Continue to use team meeting mgt tools
Continue and sustain team building

Continued Team Training

Completion LEVEL III

Institutionalization

Improved the process and shared with user Simplified/improved process used as a "benchmark"

Team example becomes model of TQ for others to follow

Process Improvement

Actual process improvement charted and documented
Take one critical process through cycle
Constantly and consistently use TQ tools
Measures and metrics used routinely
Chart and understand all critical processes
Team accomplishment to
promote continuous improvement

Problem Minimization

Maximum resource utilization
Team in-sync on prioritization of
problems/actions
Timely response on all get well dates
Closure on action plans
Ownership of actions never an issue

Goals & Objectives

Achieve stated team Quality Goals or Objs Contributed uniquely to Vision/Goals & Objs Improve goals & objectives Understand TQ tools and continually practice

Communication

Open dialog between all
(customers/users included always)
Use team meeting management tools always
Full cooperation of government and industry
Documenting, sharing, briefing results
Publicize/recognize for process improvement

Continued Team Strengthening

Continued Team Training

Illustration 4

Please note that these criteria require the QSG and the organizational leader to be cognizant of each specific Team and it's striving toward understanding, process improvement and goal achievement.

Also note that this Tool (i.e., nom form, process and eval criteria) is an aid to many Teams going in many directions -- in essence, it's an initiation and baby step incentivizer for Teaming.

Also, please remember that this is but one QSG's observation and consolidation of key ingredients necessary to Team growth and success. You may choose this template or another to monitor progress. A key feature with this template is human resource development (Team building) with putting Team CI methods in place versus product completion (results). You may wish to be more result-oriented with milestones, schedule savings, dollar savings, etc. This template is not weighted, either. It can serve as a checklist, but only with another word of caution -- Teams are dynamic in their evolution! Each team will have a different "set" of items checked. Your review of these accomplishments, and their supporting data, may indicate shades of grey on which Level to place them. Use a QSG consensus for the final recommendation on which Level to recognize and award each Team.

Your top Teams, in our case those reaching Level III, most likely are ready for other nationally recognized Quality Awards. But let's "pat 'em on the back" early for those momentous strides you're about to make!

In the spirit of cooperation, I hope the sharing of this Cooperative Team Awards program can and will help your organizational development and continuous improvement. Remember, this is a Tool to aid in your Team Building and Continuous Process and Product Improvement -- and as such, feel free to improve it or tailor it to meet your needs.

One final thought for you -- I am firmly convinced that Teamwork and cooperation is primary in our future -- and Quality Teams are soon to be the norm!

Special thanks and credit: Colonel Harry Mrozowski and Colonel Frank Stirling, USAF Retired, Col (S) Mike Prowse and our QSG members: Lt Col Bob Norris, Captain Roberta Burke, Captain Mike Polaneczky, Dave Conrad, Joe Hall, Sue Kennison, Rick Luongo, Cary Roberts, Gary Sheinfeld, Mark Lang (MITRE), Dick Marciano (SRC), Wayne Perrin (Booz-Allen), Paul Sullivan (Ultra), and Bill White (ARInc).

Self-Managing Teams



Ms. Jacqueline D. Stewart

Mrs Jacqueline Stewart is the Organizational Development Consultant for the Defense Megacenter Warner Robins.

Mrs Stewart, a graduate of the University of Alabama, University, AL, is certified to administer the Myers-Briggs Type Indicator. She has received team and facilitator training from PDS, Inc She is also the co-developer and instructor for the organization's Customer Service Course.

SELF-MANAGING TEAMS

Jacqueline D. Stewart
Defense Megacenter Warner Robins

INTRODUCTION

The Defense Megacenter Warner Robins is shaping its destiny today. To move the organization into the year 2000 the megacenter is raising empowerment to a new level and transitioning to a self-managing team-based environment.

Quality management and empowerment of process action teams (PATs) and special teams has been a way of business in the organization since 1988, when the organization was the 1926th Communications-Computers Systems Group (1926 CCSG) and later the recipient of the 1991 Federal Quality Institute Quality Improvement Prototype Award (QIP). However, under a new leadership and in the midst of DOD downsizing and streamlining, the Executive Quality Council decided to take empowerment to a new level - moving toward workplace team self-management.

To transition to self-managing teams, the Council recognized three elements should be accomplished: guidelines on how teams should function, a definition of communication flow in decision making and a commitment of resources and time.

SELF-MANAGING TEAM GUIDELINES

The Executive Quality Council had learned from the work of over 88 process action teams and special teams that the worker, the process expert, was the best source of ideas for major change. The Council chartered a Process Action Team (PAT) called the PAT PAT, composed of all grades GS-5 to GM-15, to refine our original 14-Step Quality Plan. However, the team's charter was enlarged to include producing guidelines for self-managing teams and the team's work has been compiled into a "Self-Managing Teams" handbook. The PAT PAT members were excited about helping to shape the direction of the organization with a new approach that was not "business as usual."

The PAT-PAT defined the roles of the team: coordinator, recorder, team member, supervisor, facilitator and process owner. The approach is different from some team-based environments because teams are empowered to elect their coordinator (no grade constraints), assign supervisory duties to a member (with constraints), jointly prepare their job descriptions and delegate work load (new assignments cannot change current grade structure).

Initially, teams have an interim coordinator assigned by management. After completion of Teambuilding I and II they may elect their coordinator and recorder, and assign supervisory

duties. The coordinator, who acts as the team's external primary interface, can be any team member regardless of grade. The coordinator and recorder can be elected at the first meeting.

Supervisory duties can be assigned by the team in one of three ways: to the coordinator, to another member, or to management (division chief). These duties are assigned after the team writes their job descriptions. This is critical because members' jobs are graded first on their specialist duties and supervisory duties are an overlay. There are no full time supervisors; if the supervisory duties takes up more than one half of a team member's time, then the team has not become self-managing or is too large. The team should be self-managed, not supervisor-managed.

The PAT PAT did not eliminate the manager but did redefine the role from "boss" to coach. Tom Peters says the "failure to dramatically change the roles and numbers of supervisors has torpedoed the lion's share of self-managing team experiments." ¹

One of the major challenges of the PAT PAT was to answer a frequently asked question, "Why should we act as a team when we have an individualized appraisal system?". After visiting one of the WR-ALC directorates that was working toward self-management, we became aware of Federal Personnel Manual Bulletin 990-90 which states that "raters should be encouraged, where appropriate, to solicit input from a wide range of sources including customers, other team members and subordinates to ensure the most relevant information available is used to assess performance." We realize that the appraisal system is one of the constraints we cannot break; however, we hope to develop an acceptable way to include team member input as a dominant factor in appraisals.

LEADERSHIP PROCESS

The Council 's next step was to define the flow of communication in the decision making process for all levels of the organization. This process was formalized as the Leadership Process and it provides a structured approach to how team decisions fit into the overall organizational process. Employee feedback was solicited when a draft of the process was communicated on electronic mail. The final approved Leadership Process (see Atch 1) is incorporated in our team handbook guidelines.

To provide long-term support for the teams, the Council created a Facilitator's Natural Team which is a part of the overall leadership communication process. Members of this group will help teams follow standard procedures, and will address problems and issues concerning facilitation.

COMMITMENT OF RESOURCES

To implement the new self-management approach, the Quality office was empowered to select the teambuilding trainers. Four personnel were trained on and off-site in the 6C's Teambuilding Model, Working in Groups and Myers-Briggs Type Indicators which included certification.

¹Peters, Tom. Thriving On Chaos, pg 365.

While our handbook is essential to our team progress, nothing takes the place of "hands on" training. All teams are being scheduled to participate in a workshop (Teambuilding I) which is followed by an advanced session (Teambuilding II) personally conducted by the director. The advanced session covers team definition, goals, roles and procedures from the team handbook, and how individual teams fit into the bigger organizational picture.

A requirement of the teambuilding workshop is that all members and facilitator be present at all sessions. But in a 24-hour operation, if an entire shift is present at training, how will the mission be accomplished? The seriousness of management commitment can be measured by their willingness to resolve this problem. We were impressed at senior staff teamwork in planning and supporting manning for processes that crossed their divisional lines.

Management proved its commitment once again when we requested Team Leadership training for our team coordinators. We were able to provide an eight-hour training seminar for all team coordinators.

LESSONS LEARNED

We have learned several valuable lessons during our trainsition to greater team self-management. To transition to self-manging teams you must have the full support of management and their commitment of resources and time. Prior to training we presented our training plan and required resources to train all teams. We knew we had management's buy-in when they gave us the go ahead to proceed with training across the entire 24-hour operation and they agreed to be the first team trained. This top-down approach gave us an advantage in dealing with employee concerns about the training itself by enabling managers to speak from personal experience.

Also, whenever possible, employees should decide who the members of their teams are, so they believe they have the right players for a common process.

Even though the purpose and benefits of teambuilding seem obvious, we discovered that team members had questions about why the organization was pursuing formal teambuilding and how they would personally benefit.

We learned very quickly that it was better to involve the team members in selecting the date and the numbers of days they would attend the teambuilding workshop versus the date being preselected for them. This was important because sometimes it meant members would have to adjust their schedules so that all team members were present for the workshop. Our goal was to provide flexible training options that would meet the needs of our twenty-four operations. The teams have to complete 17 1/2 hours of training, but have different options on the number of days to complete it within. The more positive the members attitudes are coming into the workshop, the more successful the workshop.

Once we were into training, we realized that there were a lot questions about what happens during the workshop and the purpose of some of the tools we use. As a result we conducted informal sessions on all three shifts describing the training and answering employee questions and concerns. For example, one concern was the use of the Myers-Briggs Type Indicator - until we explained its purpose.

Trainers must maintain the confidentiality of all discussions during every workshop because, if word gets around that this trust is violated, future workshops will be affected adversely.

We also learned that some employees do not understand the nature and benefit of consensus decision making. And some managers and employees are impatient with the time required for this. But we find that consensus creates group commitment to team decisions.

Managers must demonstrate unwavering commitment because the level of energy teams invest in growth toward self-management will depend upon their perception of how serious their manager really is. Managers must take the time to provide daily coaching as needed. Managers must teach teams how to handle the new responsibilities that come with greater empowerment. Teams must be given not just training but information so they can make good decisions. Managers must also coach teams faced with difficult decisions and be on guard against reverting to old habits and making decisions for the team. Managers must believe that team mistakes are okay during the growth process.

Change is not easy. During the early training days we faced some negative attitudes. So we, as trainers, make a special effort to be positive role models of teamwork, and we make ourselves available for as much follow-on assistance as teams feel they need. In short, teambuilding trainers are salesmen.

RESULTS

Has the effort been worth it? Absolutely! We see people leaving the workshop going back to work with a new outlook and positive attitude. We received positive feedback from the shift employees thanking us for the opportunity for their entire team to come together and discuss issues affecting them. Some have expressed their gratitude at just having lunch together - something that day shift employees take for granted. We saw team members committing to being more understanding and appreciative of one another. We had one team who left the workshop with over 30 new ideas for ways of improving their work environment. The entire organization has learned valuable ways to be more sensitive and more able to communicate effectively with hearing-impaired team members. Self-management has resulted in better communication across organizational lines. The organization is also more streamlined with only two levels of supervision between any employee and the director.

During this first year of this transition to greater self-management teams, feedback is already positive with comments that communication is better, processes are more streamlined and time is being saved by getting together exploring and building on each other's ideas. Teams are also

more accepting of the transition to greater self-management. They appreciate being trusted to interview and select new team members. They also value being empowered to distribute workload among themselves.

We have come a long way in the transition to self-managing teams however, we recognize we have a long road ahead of us. We need time to continue growing and maturing. We are shaping our destiny today. The Defense Megacenter Warner Robins is confident that the return on investment will far outweigh the cost.

(Please note: DMC Warner Robins was formerly designated WR-IPA)

WR-IPA/653 CCSG SELF-MANAGING TEAMS HANDBOOK APPENDIX E

WARNER ROBINS INFORMATION PROCESSING ACTIVITY (WR-IPA) LEADERSHIP PROCESS

INTRODUCTION

The WR-IPA leadership process governs the setting of organization visions, missions, goals, and objectives. It provides a formal way to reach decisions when self-managing teams cannot.

STRUCTURE

The leadership process consists of the IPA Senior Representative Team (ipsrt), the IPA Staff (ipstaff), the 653 CCSG/WR-IPA Council (qualc), and the Facilitators' Natural Team. Key customers and suppliers of the leadership processes are the teams of the WR-IPA. Inputs are in the form of ideas. Outputs take the form of decisions. The process is shown in figure 1.

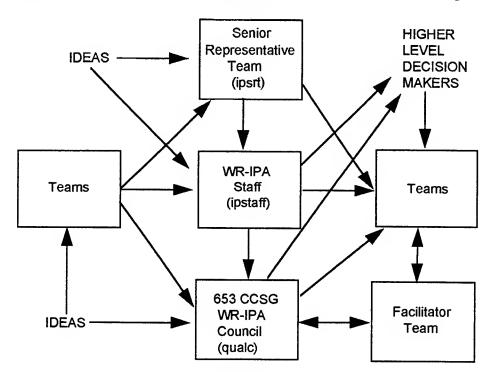


Figure 1. WR-IPA Leadership Process

INPUT

Inputs to the process consist of ideas. Normally, ideas are plans (such as the Business Plan), values (such as those captured on our value card), goals and objectives (such as those in our business plan), personnel policy (how work plans and appraisals are accomplished), metrics (such as monthly process reviews), "anon" or anonymous email notes, results of surveys, or any other idea, issue, policy, or question. Such ideas are posted on Logdis as Leadership Process Agenda Items.

All IPA teams and other customers are encouraged to generate ideas and submit them to the appropriate recorder. Any individual connected to the worldwide internet can provide ideas by sending an email to ipsrt, ipstaff or qualc. They may also use anon if they do not wish to give their name.

SUPPLIERS

The key suppliers of the process are the IPA teams and their members. Other suppliers are IPA customers who may have ideas for consideration and higher level decision makers who provide assistance, guidance, and constraints.

OUTPUT

Outputs are decisions reached from the ideas submitted. Outputs are available on the Z-6 menu of Logdis.

CUSTOMERS

The key customers of the process are IPA teams. Other customers are customers of the WR-IPA who might be affected by the decisions, including higher level decision makers.

PROCESS

The process is the formal flow of ideas as shown in Figure 1. Processing in the individual blocks takes place as described in the 653 CCSG/WR-IPA Self-managing Team Handbook and as described below.

Ideas come from suppliers. They can flow into any of the three process teams (the SR Team, Staff, or Council). If the ideas require decisions, they are forwarded to the team which has the authority to make the decisions.

Ideas are listed as WR-IPA Leadership Process Agenda Items and are listed in Logdis in the Z-6 menu. Their status is listed in the item.

Ideas are prioritized by the team to which submitted; priorities are 1 through 5, 1 is the highest. The priority determines which idea will be considered first. Any IPA team may request a change in priority.

The leadership process is not intended to constrain communications or self-managing team decision making. Informal communication is expected between all blocks in the process. Self-managing teams are expected to make decisions within their authority. The leadership process is the formal way that decisions are made if the team cannot.

TEAMS

Teams are the organizational and cross-organizational teams which accomplish the mission of the IPA. These teams are self-managing, but all teams need support from and are subject to the constraints of the leadership process. The term includes all teams shown in Figure 1.

WR-IPA SENIOR REPRESENTATIVE TEAM

The IPA Senior Representative Team, ipsrt, consists of the senior representatives assigned to the IPA and the senior communications and small computer members of the 653 CCSG team who have been through team building as a team. This team is non-representative; members are expected to represent the IPA as a whole rather than their own processes. Substitutes are not allowed for members who are not available for a meeting. All members may express their opinions and vote on all items discussed whether they are present at the meetings or not.

This team does not make decisions (expect on classified or privacy act protected items). Rather members discuss items presented to learn the sensitivities of other members. Items needing decisions are forwarded to the IPA Staff or Council. Items which do not need decisions are given to the senior representatives for action.

This team has one of the only two closed meeting in the IPA. As such, it makes decisions on items which are classified or protected by the privacy act. Closed meetings also encourage "straight talk" among its members.

The team normally meets once a week for one hour and holds other meeting on individual items if needed. Results are published on Logdis as changes to the agenda items.

WR-IPA STAFF

The WR-IPA Staff, ipstaff, consists of a representative from each IPA group of self-managing teams, the quality focal points, and the senior site representatives. This team is representative; members represent the interests of their teams and substitutes are encouraged for meetings when the senior representative is not available.

This team makes decisions on items which impact only the IPA. Items of a broader scope are forwarded to the Council for decision. Items which do not need decisions are given to the members for action. Decisions are made by consensus of all representatives present. Senior representatives may request an item be processed again if later information reveals that the decision may not have been in the best interest of the IPA.

Team meetings are open. Anyone interested in the items to be discussed is invited to attend. They may come and go, depending on their interests, provided they do not disrupt the proceedings. Only the primary representatives may vote on an item. Because meetings are open, classified items and those protected by the privacy act may not be discussed.

The team normally meets Tuesday and Friday each week from 0800 to 0855 to review system operational performance and monthly to review WR-IPA system performance. The Friday and monthly meetings are combined with the 653 CCSG staff. The team also meets at other times on individual items as needed. Decisions are published on Logdis as changes to agenda items.

653 CCSG/WR-IPA COUNCIL

The 653 CCSG/WR-IPA Council, qualc, consists of the Commander and staff of the CCSG, a representative from each IPA group of teams, and the Senior Site Representative. Quality focal points of both organizations are invited to attend as nonvoting members. This team is representative; members represent the interests of their teams, and substitutes are encouraged for meetings when the Senior Representative is not available.

This team makes decisions on items which impact both the 653 CCSG and the IPA. Items which do not need decisions are given to the members for implementation by their teams as appropriate. Decisions are made by consensus of all representatives present. The Commander and Senior Site Representative may request an item be readdressed if later information reveals that the decision may not have been in the best mutual interest of the members.

Council meetings are open. Folks interested in the items to be discussed are invited to attend. They may come and go, depending on their interests and provided they do not disrupt the proceedings. Only the primary representatives may vote on an item. Because it is an open forum, classified items and those protected by the privacy act may not be discussed.

The Council normally meets every Friday at 0900 to 0955 and at other times on individual items as needed. Formal agendas are provided before the meeting and formal minutes are published on Logdis.

HIGHER LEVEL DECISION MAKERS

Higher level decision makers are the organizations of DISO in the IPA chain of command that provide us council, advice, guidance, and constraints. It also includes all other decision makers whose decisions support or constrain WR-IPA teams. Formal issues are raised to them by issue papers which are available on Logdis.

FACILITATORS' NATURAL TEAM

The Facilitators' Natural Team consists of CCSG and IPA facilitators who are willing to serve in this role. It is under the Council. This team is non-representative; members represent the CCSG and IPA as a whole rather than the organization from which they come, and substitutes are not allowed for members who are not available for a meeting.

This team addresses problems and issues concerning facilitation of other IPA teams and is expected to promote standardization of teambuilding and team execution across the entire organization. It is also expected to identify team building tools and training needs. Decisions at made by
Meetings of the team are one of only two closed meetings in the IPA. It is a closed forum to encourage its members to "straight talk" about team problems involving personalities of members of the CCSC items which are protected but to private act. These meetings are the order to the contract of the con

of the CCSG, items which are protected by the privacy act. These meetings are the only place in which facilitators may discuss the performance of teams they facilitate without the permission of the teams. In their capacity as a facilitator, they are considered "confidential employees" and are expected to uphold that confidentiality.

The team normally meets _____. Results of the Facilitators' Natural Team meetings are published on logdis.

OTHER TEAMS

The Senior Representative Team and Council may establish other process action teams as part of the leadership process. An example of such a team is the process action team which developed the Self-managing Team Handbook. The flow of information for such teams through the leadership process is dependent upon the teams' specific purposes.

ENVIRONMENT

The Leadership Process applies to the WR-IPA and to the 653 CCSG for joint meetings and the Council. It is part of the larger processes of the Warner Robins Air Logistics Center and other customer processes. It is also a part of the Air Force Information Systems Center and other Defense Information Systems Agency Processes.

BOUNDARIES

The Leadership Process begins with the ideas which are submitted to it and ends with the decision concerning those ideas. Although the effects of those decisions are reviewed in the process, it does not include the implementation of the decisions. Implementation if a part of their processes.

INTERFACES

The Leadership Process interfaces with other processes of the WR-IPA at the input and output. Ideas come from teams and decisions are passed to teams. There also is an interface with higher level decision makers to pass issues for resolution.

MACROPROCESS

The Leadership Process is one of the macroprocesses of the WR-IPA.

SUBPROCESSES

No subprocesses of the Leadership Process are defined.

METRICS

The team recorder gathers metrics after each formal meeting of teams in the process. The recorder posts the metrics on manual charts. The coordinator briefs the overall metrics at the monthly process review and has them available for the quarterly ALC process review.

Metrics consist of the following:

Availability: Measures how accessible the process is to organizational teams when needed. X-Bar and R charts show quarterly survey results.

Reliability: This is not measured since there is no Mean Time to Repair (MTTR).

Responsiveness: Measures the time an idea is processed from input to output based on priority. X-bar and R charts show processing time divided by priority.

Customer satisfaction: Measures how well teams and senior representatives are satisfied with the results of the leadership process. X-bar and R Charts show quarterly survey results.

Business performance: Shows the number of man hours taken to process each idea plus documentation time within the process. X-bar and R charts show man hours per idea.

Idea count: Measures the number of ideas which were input to, are pending review at some stage, and output from the process. X-bar and R charts show the number of ideas by team in the three categories areas.

CONTINUOUS IMPROVEMENT

The Council updates the Leadership Process whenever changes are needed. It is formally reviewed as described in the Annual Team Checkup section of the Team Handbook. Teams and other customers are encouraged to submit suggested process improvements to ipstaff. The next formal review of this process is expected in October 1994.

VISIBILITY

Ideas, in their various stages in the process, are shown as WR-IPA Leadership Process Agenda Items in the Z-6 menu. Their status is listed in the item.

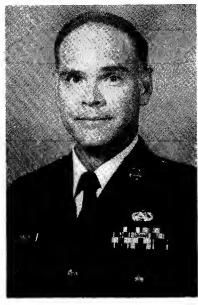
References

Aubrey, C and Felkins, P. <u>Teamwork: Involving People in Quality and Productivity Improvement</u>. Milwaukee: ASQC Press, 1988.

Peters, Tom. Thriving On Chaos. New York: Harper & Row, Publishers, 1987.

WR-IPA/653 CCSG Council. Self-Managing Teams. Robins AFB, GA, 1993.

Squadron Based Quality Improvement Training



MSgt Claude A. Johnson, Jr.



Capt Mitchell D. Sneck

MSgt Johnson was born in Louisville KY in 1952. After graduation from Fern Creek High School, he worked in the family restaurant business until entering the Air Force in 1976. Trained as an Automatic Tracking Radar Repairman he operated and maintained ground based electronic warfare threat simulators at radar sites in Nevada, the Philippines, and Guam. MSgt Johnson served as a Management Effectiveness Inspector at HQ 1st Combat Evaluation Group, Barksdale AFB, LA from 1983 to 1989 and was responsible for evaluating radar maintenance management at 12 CONUS and three overseas locations. In 1990, he was chosen to be one of the initial cadre of specialists tasked to develop the Statement of Work used to civilianize and monitor contractor performance at ACC's Tactical Training Range complex. MSgt Johnson has a Bachelor of General Studies from Louisiana Tech University and a Masters Degree in Systems Management from the University of Southern California. He is a member of the American Society for Quality Control, a ASCQ Certified Quality Auditor, and a AFQI certified Master Instructor.

Raised in upstate New York near Troy, Captain Sneck attended Hartwick College in Oneonta, New York graduating in 1978 with a BA in Economic Geology. His early management skills were honed as a branch manager at several AVCO Financial Service offices and as a consultant with the New York State Higher Education Services Corporation. After Officers Candidate School in 1982; navigation, electronic warfare, and B-52 combat crew training schools quickly followed. First assigned to the 20th Bombardment Squadron at Carswell AFB, Texas, he performed strategic nuclear alert and squadron executive officer duties until selected as B-1 initial cadre in 1986. Stationed next at Ellsworth AFB SD, Captain Sneck held several positions at both the 28th Bomb Wing and the 99th Wing. He served the 28th as an Instructor Defensive Systems Officer, Chief - Combat Tactics, and Chief - Electronic Combat Employment. During his tour at the 99th, he instructed at the SAC Tactics School, commanded the B-1 Test Flight, and finally, directed the wing Quality Improvement Directorate. Captain Sneck has masters degrees in production and business from East Texas State University and the University of South Dakota. Captain Sneck is currently stationed at Hurlburt AAF, FL, as the Air Force Operational Test Center's AC-130, ALQ-172, test director.





SQUADRON BASED QUALITY IMPROVEMENT TRAINING

MSgt Claude A. Johnson, Jr. & Captain Mitchell D. Sneck

Quality Improvement Directorate

99th Wing, Ellsworth AFB, SD

ABSTRACT

In August of 1993, the 99th Wing Quality Improvement Directorate published a Quality Deployment Plan (QDP). The purpose of the plan was to provide wing personnel with an objective, thorough, and systematic "road map" to implement QI throughout the organization as well as provide senior leadership with a template to facilitate future Strategic Quality Planning and Unit Self Assessment (USA) efforts. The impact of Air Force-wide manning reductions, increasing fiscal restraints, organizational re-alignments, and mission changes had combined to mandate unprecedented changes within the Wing. The QDP facilitated continuous improvement methods throughout the wing by using discrete tasks applied directly to day to day operations. The directorate hoped that this approach would help wing personnel perceive QI as a method of coping with change, increasing mission capability / productivity, and reducing frustration rather than as another additional duty task to be completed as soon as possible so that the next crisis could be dealt with.

¹ Berry, Thomas H., <u>Managing the Total Quality Transformation</u> (New York: McGraw Hill, 1991), pp. 184-188.

To facilitate implementation, the Quality Training Directorate envisioned the squadron as a large Quality Improvement Team (QIT) and expanded the scale of existing QIT training curricula for application at this level. Squadron based training was born. The results of this approach have, in many cases, been totally unexpected.

RATIONALE

Squadron based training originated as a logical extension of General Loh's recognition of the Squadron as the basic unit of production within Air Combat Command. Many Quality theorists such as Juran, Berry, and Deming teach that the quality transformation will never be completed until front line personnel (those with the greatest potential to impact customer service and satisfaction) learn, understand, and apply continuous improvement principles and techniques ¹. Feedback from students and Senior Leadership indicated that, although QI philosophy and methodology were taking root within the wing, a serious gap still existed. This gap manifested itself as a general failure to assimilate QI into the culture of the organization.

Although QI Team focus had created numerous "islands of quality" throughout the wing, little was being done to build the bridges necessary to sustain a continuous "quality transformation" on a large organizational scale. Normal training initiatives inherently fail to provide the critical motivation needed for the degree of personal commitment and involvement required for long term cultural and behavioral modification on a broad-based, grassroots scale.

THE GAP

Initial curriculum design efforts focused on Basic Awareness, Executive, Leaders and Supervisors, and QIT training. As more personnel became "basically aware" and as more leaders and coaches were trained, more teams began to spring up. The "successes" of these teams were highly publicized and led to a clamor for more teams. Training focus

began to gravitate towards QI Team training and various types of generic Tools and Techniques classes. Unfortunately, application of QI methods and tools apart from the classroom or Team Charter was rare to non-existent. Personnel understood QI based on "the part of the elephant" that they had touched.

As more and more Work Group and Cross Functional Teams were chartered, process owners observed that although QITs are productive, the expense required to sustain the teams, computed in hours of work and time invested, was significant. In some cases up to 30% of the squadron's personnel assets were working on teams at any given time; average life span of a cross functional team was 6 - 8 months. Line supervisors became increasingly frustrated trying to "schedule our people around those damn meetings."

Many team members failed to communicate team goals and acted alone when gathering ideas and data from the workplace. Their repeated absence and "meddling" was viewed as mandatory participation in "another management boondoggle". In many squadrons, leadership itself was still struggling to understand exactly what QI entailed and were reluctant to implement it on an organization wide level, especially after enjoying the early successes of their teams. The organization was quickly reaching QIT saturation; critical mass was imminent.

THE SOLUTION

To bridge and hopefully eventually eliminate "the gap", QI instructors began to teach squadron commanders and coaches the continuous improvement principles contained throughout team training. Instructors replaced "academic environment" exercises with practical exercises that focused on determining the unit's customers, suppliers, products, processes, and quality criteria for the processes they participated in or owned. The process, now known as Customer Output Products Inputs Supplier (COPIS), is taught to every Unit Self Assessment and Inspector General QAFA team member in

ACC. Instructors then assisted commanders and coaches in setting up sessions for squadron personnel. Squadron commanders and coaches were encouraged to design their own class sizes, target audience, timetables, and specific curricula items based on their organizational needs. The following are three examples of the results of their efforts:

347th Adversary Threat Squadron (ATS)

One typical Friday afternoon, Lt Col Pat Clune, 347th ATS Commander held Commander's Call. It was not a normal Commander's Call. He did not pass on the usual current notes from the 99th Wing staff meeting, he did not give a safety briefing, he did not give out any awards and decorations, and he did not show an "Air Force Now" film. He did ask his assembled personnel four deceptively simple questions: "What do you do?," "Whom do you do it for?," "Why do you do it?," and "Do you need to continue doing it?" Although it was not their first exposure to Air Combat Command Quality Improvement, it did signify a distinctive milestone, not just for the 347 ATS, but for the 99th Wing as well. "We had developed a mission statement for the squadron, but I had to get people to think hard about those four questions before real progress could begin" Colonel Clune stated.

The 347th now has bi-monthly Commander's Calls. These sessions resemble an informal, after dinner family conversation, more than a structured class or meeting. In one session, Lt Col Clune tasked his people to keep a informal listing of the things they did on the job over a two-week period. When composing the lists, he asked his people to divide them into "the things I do because I decide they must be done" and "the things I do because it's always been done that way or a regulation or someone else said had to be done." The real benefit of this exercise was that it helped people to identify and prioritize their customers as well as the products those customers require and it helped identify and eliminate non-essential tasks. "When we got together and discussed the lists, everyone left with a much better idea of how the guys in the next cubicle were contributing to the mission." The lists also helped squadron members and leaders clearly visualize time and

human resource expenditures. "Once we had a clearer picture of what we were doing, who we were doing it for, and why we were doing it, we had to go back and redo our organizational chart. It really helped us focus on lateral processes rather than on traditional stovepipe functions," Lt Col Clune admitted.

To help combat what he terms "micro-mentality", Lt Col Clune identified his process owners and tasked them to flow chart and brief their process(es) to the rest of the squadron. The process of obtaining DITS (Digital Imagery and Targeting System) is flow charted in Figure 1.

Figure 1. DITS Imagery Process Flow Chart Print auto Fax request Enter Info Request Receive to 20 AIS form filled Form into Dbase equest form request Correct? NO YES Transfer No further Print Notify Receive image to action requester image image imagery disk usable NO YES image worth saving NO Delete No further image action file

To help, instructors from the QI Office and coaches conducted flowcharting classes specifically tailored to squadron processes. Lt Col Clune led the way by flow charting and briefing one of his own processes to his "stakeholders." 2nd Lt Susan DeYoung, Current Intelligence Briefer, summed it up by saying, "The flowcharts really helped us." After we

did them, it was a lot easier to see what we contributed to a process, where the bottle necks were, and what we had to get from other organizations in order to do our job. It also helped us to discuss our flowcharts with co-workers. We've just started but we have already been able to identify some duplicated and non value-added effort." Lt Col Clune stated, "to eliminate micro-management, I have to demonstrate my own personal belief that everyone is here to do a good job and to actively nurture and cultivate that belief throughout my organization. You can preach empowerment, but it does not happen overnight, and will not happen until people accept it. Each individual has to really believe that he or she can make a difference. They have to believe they do have the power to change their workplace. Until they do, all of the quality training in the world will not make a difference. They have to be involved."

Lt Col Clune summed up by saying, "I know I don't have total buy-in yet, but things are a lot better. As the force structure changes, so do our mission requirements. Our budget is constantly getting smaller. People are anxious about what is going to happen to them and their families. This has resulted in a huge amount of stress in the workplace. A side benefit of using quality improvement to focus energy on the mission, was the reduction of stress by empowering people to make changes to the processes they owned. Even though our future is very uncertain, my people feel better about themselves, about their jobs, about how they spend their time, and about their qualifications for better assignments in the Air Force or better jobs in the civilian sector. The bottom line is happier people and better, more usable products for our customers. It's a win-win situation."

99th MAINTENANCE SQUADRON (MS)

In a similar "Commander's Call", Major Dale Balmer, Commander of the 99th Maintenance Squadron (MS), used ideas from Stephen Covey's, *The 7 Habits of Effective People*, to discuss organizational values with his officers and NCOs. They quickly determined that, although they shared the same core values, they had very different

operational definitions. Coaches posted "Graffiti Boards" throughout the squadron to obtain feedback from the workplace on perceived organizational values. The resulting data indicated that personnel perceived two sets of values dependent upon rank. Using his key personnel, Major Balmer developed organizational values for the entire organization, generated operational definitions based on consensus, and tasked his supervisors to communicate these values by "walking the talk".

Major Balmer now uses his QI Coaches to teach weekly classes to mid-level _managers. In one such class paradigms were discussed, however after viewing Joel Barker's video, discussions centered on identifying Squadron paradigms and how they could be changed to reflect QI philosophy and methods. Specific paradigms were targeted, Force Field Analysis conducted, and strategies to maximize/minimize were formulated.

As part of each class, students are given "homework" assignments that require them to teach the current topic to their people and brief the results at future classes.

Coaches and supervisors are then able to discuss the topic from a management team perspective, help each other overcome barriers, and assist each other in future efforts.

The benefit of this type of training is that it not only drastically increases mid-management involvement in training and mentoring, it involves people at all levels of the squadron. It also exponentially facilitates continuous improvement implementation and awareness throughout the entire organization.

Tools training is a major focus within the 99th MS. Coaches use QIT curriculum examples to teach mid-level squadron personnel the uses and potential benefits of statistical process measurements. They then challenge them to apply these tools to their own processes on a daily basis. Again, personnel are required to train their "process team members" and share their progress with their peers. Personnel at all organizational levels are able to participate and help develop both "along the way" and "bottom line" process measurements. By keying on upper and mid-level squadron leaders, Major Balmer is able

to use their pivotal role as the hub of the organization to focus measurements towards mission accomplishment and organizational goals.

346 TEST & EVALUATION SQUADRON (TES)

The commander, Lt Colonel James Shanley, and his squadron coaches decided to approach squadron based training by implementing a Customer, Outputs, Products, Inputs, and Supplier (COPIS) exercise throughout the squadron. Squadron training efforts initially focused on identifying squadron processes such as test plan production, test execution, and test report final editing. Using processes as the hub, subsequent sessions were used to analyze product, customer, and supplier synergy and interdependency. Commander led sessions produced detailed COPIS relationships such as the one at Figure 2.

Figure 2, 346TES External COPIS

PRODUCT ANALYSIS EXTERNAL

1. KEY OUTPUTS/PROD UCTS	2. KEY PROCESSES	3. KEY DATA SYSTEMS FOR THE PROCESSES	4. PERFORMANCE/ QUALITY INDICATORS FOR KEY PROCESSES
Test Plan	As Outlined in Project Manager's Handbook Regulations Review of Previous Tests	Project Manager's Handbook Test Plan Outlines MCR 55-133 Corporate Knowledge	Approval with Minimum Changes Certification Ops Analysts Agreement on Test Methodology Meet Suspense
Project Order	Tasking from ACC/DOTW	Telephone/Facsimile Machine	"Up" Time Meet Suspense

CUSTOMER ANALYSIS EXTERNAL

5. KEY CUSTOMERS	6. QUALITY REQUIREMENTS AND ASSOCIATED INDICATORS FOR THOSE CUSTOMERS	7. INDICATORS OF CUSTOMER SATISFACTION		
ACC WTC	Timely Detailed Accurate Clear Accountability	Approval Funding Minimal Changes Meet Suspense		
ACC/DOTW	Clear Concise	Minimal Changes Execution of Project Order		

SUPPLY ANALYSIS EXTERNAL

8. KEY SUPPLIER INPUTS	9. METHODS OF INPUT AND INDICATORS OF INPUT QUALITY	10. KEY SUPPLIERS OF THOSE INPUTS
ACC TRB 5 Year Test Priority List Funding	Formal Tasking Message	ACC AFOTEC AWC ACC/AWC/WTC/AFOTEC
Funding/Material	Published Reports Ops Analysis of Reports	AWC ACC
Test Results (FME, TD+E, etc.)	Telephone	ACC/DOTW
Staff Guidance		

The information and knowledge gained from these exercises was used to review/update the unit's mission statement, goals, and process measurements. Again, initial sessions operationally defined the term or subject of the training with discussions used to achieve consensus and focus awareness towards squadron application. Customers or suppliers were often invited to training sessions to discuss their requirements and constraints with the squadron personnel. Travel pay changes and ambiguities were clarified by a face-to-face interview with the Travel Pay Superintendent. He explained the correct procedures to eliminate the most common filing errors. This significantly reduced travel voucher returns over the next several months - no travel vouchers were returned due to improper completion since the training session, a reduction from 40% to 0%. These face-to-face sessions help humanize relationships, increase cross functional understanding, and

significantly improve overall squadron productivity. The results of these training sessions focused the squadron on customer/supplier relationships, thus lowering the "pain threshold" of the Unit Self Assessment.

Although squadron members feel that they have only taken the first steps on their quality journey, the people of the 346th agree that they have already seen improvement. When asked if they have seen any practical benefits to using QI methods, they are quick to respond that, "It's still a little scary, but working. It really helped us focus on the real mission and what we really do." Many people in the squadron have started to see their jobs from a broader perspective; some have realized that much of what they do is non-value added. However, instead of viewing customers and suppliers as impersonal entities, squadron members now have a face to match the voice on the phone. And most importantly, squadron leadership acknowledges that failure is not always the fault of the member, but a failure in the process in which the member must work.

THE PAYOFF

Since initiating squadron based training in early FY 1994, the 99th Wing has experienced a definite shift in culture. Since the start of the current fiscal year, the wing has deactivated 3 squadrons resulting in a 17% reduction in personnel. This has been accomplished with minimal disruption and no loss of mission capability. Formally chartered Quality Improvement Teams are the exception rather than the rule: the wing currently has only two formal QITs. Future team training time will be reduced approximately 33% since students are already familiar with the continuous improvement seven step process, scientific methodology, paradigm identification, supplier - process - product - customer dependency, and basic tools used to measure process quality and variability. The difference of the knowledge level of students entering team training has been liked to the difference between honing and coaching an all-star team vs. a new group of rookies. Quality improvement is beginning to take root, to be regarded as a positive,

helpful method of working rather than as another short lived "program". Frustration levels have dropped as personnel improve their processes, understand what their co-workers are doing when participating on cross-functional teams. Leaders understand the organization's priorities better and are more empowered to manipulate resources to maximize mission efficiency. Squadron based training has led to increased knowledge and communication at all organizational levels.

SUMMARY

The major long-term benefits of Squadron based training as opposed to an emphasis on QIT training can be summed up as follows:

- 1. Direct involvement by organizational personnel is significantly increased through the use of squadron based training. Direct involvement in continuous improvement activities are enhanced by utilizing upper and mid-level Squadron managers to apply QI methods directly to their processes, teach these methods to their subordinates, and brief supervisors and peers on the results. This immediately gives them a greater stake in the mission. When cross functional teams are chartered, supervisors have a much better concept of what team membership entails and are able to function as a "shadow coach" for the team member within the natural working group. This not only reduces frustration in the workplace, it multiplies the brain power of the team.
- 2. The time required for genuine cultural transformation and broad-based continuous improvement implementation is reduced since training incorporates the unit's unique mission, vision, values, and goals and applies them directly to the broad spectrum of Squadron customers, suppliers, products, and processes rather than training targeted on specific functional or cross functional process components.
- 3. Squadron based training helps establish and foster clearer, more concise customers, suppliers, and cross functional process workers for discussions with squadron personnel. Since the audience is larger and most are members of the same "unit of production", the increase in awareness and understanding is much more extensive in a squadron based training forum than in a relatively small QIT meeting.

- 4. Scientific measurement and improvement methods spread exponentially throughout the entire organization rather than being restricted to the portions of the process the QIT is currently addressing. In today's environment of personnel reductions, and training dollar restraints this approach establishes human involvement across a broad organizational base and contributes significantly to the continuity of process measurements.
- 5. Training becomes proactive rather than reactive by focusing on specific Strategic Planning objectives rather than providing training to teams after an opportunity has "bubbled-up".
- 6. Roles and responsibilities are more clearly defined at the squadron level through COPIS awareness, barrier identification, and increased communication. Quality Improvement Teams must often cross functional barriers where the Process Owner, Coach, and Team Leader must form, storm, and norm before they can perform.
- 7. The human investment necessary to sustain improvement gains is enhanced since unit personnel build upon their shared experiences in much the same way as QIT members do. These "beneficial behaviors" continue to build through day to day practice and utilization.

CONCLUSION

Although squadron based training does not replace the need for other forms of instruction, it can significantly increase overall familiarity with continuous improvement philosophy and tools and enhance overall cultural acceptance of QI within the basic unit of production. Squadron based training takes QI out of the classroom and weaves into the very fabric of the organization; where it belongs. Sustained Quality implementation requires a grassroots shift in the values, paradigms, and behavior of the workplace. The

understanding of tools and techniques are a function of education, training, and practice. To achieve behavioral shifts, individuals and organizations alike must become actively involved, value the changes, and implement them on a consistent basis. Understanding and involvement must occur at both the cognitive and affective levels to result in a broad based cultural shift. The 99th Wing continues to search for better ways to implement Quality throughout the organization.

Supporting High-Performance Teams: An Architect's Perspective



Capt Mark L. Gillem, RA

Capt Mark L. Gillem is assigned to the School of Civil Engineering and Services at the Air Force Institute of Technology where he is an Instructor in Architecture. He earned a Bachelor of Architecture degree with highest distinction from the University of Kansas in 1989 and he is a registered architect in South Dakota. His military decorations include the Air Force Commendation Medal, the Air Force Achievement Medal, and the National Defense Service Medal.

Supporting High-Performance Teams: An Architect's Perspective

Capt Mark L. Gillem, RA The Air Force Institute of Technology

Abstract. A cultural shift is underway that is changing the nature of the work process and the organization's approach to that process. As American society in general and the Air Force in particular restructure into a leaner, service-oriented mode, teams of highly knowledgeable workers will be the standard organizational pattern. These project-focused teams will consist of a self-managing group of interdependent knowledge workers. Benefits of these teams include greater commitment, higher quality, and quicker execution. In order to facilitate teamwork through changing management structures, high-performance teams of the 21st century will require spaces that facilitate their performance. Since the development of these teams implies an open, participative approach to project completion, the architecture they operate in must be supportive of this open work style. Not only should environmental stressors like poor air quality, excessive noise, and improper lighting be removed, but design strategies that respond to the unique requirements of high-performance teams must be implemented. This paper studies three specific needs of team environments. While individuals still need a sense of privacy, communication must be unhindered and the environments themselves must be flexible. A model for the future is presented that respects the lessons from the past. Specific components of high-performance team environments include individual alcoves, team spaces, and commons.

Where Are We Going?

Cultural Change. Increasingly familiar to members of today's work force are terms like downsizing, restructuring, rightsizing, and outsourcing. Taken together, they form a picture of tomorrow's work force. It will be culture driven by intense global competition that requires increased productivity through the integration of people and processes (Olson 24). Why is this happening? First, society's needs are shifting. In the past, businesses primarily manufactured products; today businesses provide knowledge-based services. Within the Air Force, we are moving from front-line workers to service-contract managers. More base operations are being contracted out resulting in fewer Air Force personnel. By contracting out the Civil Engineering Squadron, California's Onizuka AFB is an example of this emerging trend.

In addition to this shift, the United States' labor supply will grow by less than 1% per year through the end of the decade. This will lead to the tightest labor market since the 1940s. Yet projected growth rates in technical and professional fields exceed 20% during the remainder of this decade (Whitaker 988). Hence, it becomes increasingly important to understand the needs of these knowledge workers. These statistics support Whitaker's contention that competition for workers, particularly knowledge workers, will become more fierce in the future. Addressing their

goals and needs "...are means companies can use to attract workers" (988).

Process Change. Two work place trends will affect the work process in the coming years according to Kruk (526). First, the increasing reliance on technology will change jobs altogether. Technological changes from multimedia technography to wireless communication systems will make it possible for these knowledge workers to operate with increased autonomy. At the same time technology may facilitate this autonomy, the importance of teamwork "has become an article of faith in many companies as the prerequisite of creative problem solving" (51). The move toward using workers who can add value to the product through informational knowledge will

lead to a decreasing dependence on white collar workers who simply pass on information without adding to the value of the final product (526). This move creates a streamlined work process from doers directly to decision-makers without the layers of bureaucracy that characterize so

many military organizations today.

Second, the stars will be the "information elite who are highly skilled in accessing the organization's vast information resources and using those resources to solve problems" (527). Think of the demand placed on a system administrator and you may understand what this process shift means. As knowledge becomes the prized currency, each person may become more specialized "in an effort to enhance the value of his or her own knowledge" (Herman Miller, 1989, 9). Solutions to complex problems will require the skills of different experts working together as a team (9). Quality Air Force recognizes this move toward teams and asks leaders to foster an environment that inspires pride, trust, and teamwork (Holmes 1-2).

Organizational Change. Teams, specifically high-performance teams, will be the organizational approach to these cultural and process changes. Within the Air Force, the quality improvement process utilizes a team orientation that allows members to join together to meet common goals (1-2). As Whitaker predicts, "We are moving from managing by control to leadership of accelerated change. This change is pushing organizations to use self-managed work teams and interdisciplinary development teams" (987). But teams are not revolutionary. Autonomous, interdependent teams -- known as families -- are responses to basic human needs. Like strong families, teams that combine the skills of their members with the higher motivation of the group can "reach extraordinary levels of achievement" (Bassin 29).

Futurist Marvin Cetron forecasts that by the end of the decade the "information based organization will be based on teams of task-focused knowledge workers" (Herman Miller, 1989, 9). This change to interdisciplinary teams is underway. Chrysler's new Corporate Technology Center is one example of a building supporting high-performance teams. It supports the work of cross-functional platform teams composed of designers, engineers, accountants, marketers (Olson

26). These teams focus their efforts on one platform, such as the successful LH series.

With an increasing reliance on teams within organizations, one might ask what these new organizational structures will look like. According to the Hudson Institute, participation, empowerment, and superteams will define the successful organizations of the next century (Kruk 525). Charles Handy characterizes these superteams of the 21st century work force as shamrock organizations in which contractors and part-time help augment a small core of full-time personnel (Frieman 50). Similarly, author Quinn Mills calls for "the cluster organization that is a self-sufficient department subdivided into self-directed work teams of five to seven people each" (Peters, 1992, 245). Each of these organizational visions calls for high-performance teams. According to a 1991 *Industry Week* survey of 862 executives, over half of the executive's work forces will be organized into some type of self-directed, high-performance team by the late 1990s (Wellins & George 27). What was once viewed as unique experiments "may become the workplace wave of the future in terms of peak performance and organization" (26).

High-Performance Teams

A Working Definition. A high-performance team is more than a football or tennis team coming together for a championship season. Think of these teams, whether on the playing field or at an Air Force base, as groups of people who can maintain superior output and member satisfaction (Bassin 63). They are usually thought of as a self-directed small group of employees responsible for an entire work process or segment (Wellins & George 27).

Attributes of a High-Performance Team. High performing teams are not created overnight. The main ingredients in such a team are an increased sense of involvement and greater responsibility for the results by all team members (Bassin 64). Generating these qualities takes time. These teams are more than Process Action Teams or Tiger Teams who only come together on a temporary basis. They are self-managing teams with long-term projects and a sense of long-term commitment. Also, they are usually project focused, not sequentially driven (Herman Miller,

1989, 2). Think of a successful team of emergency room doctors or a team of architects focused

on a building project and you have a sense of a high-performance team.

The people working in these teams are neither dependent nor independent but "interdependent" (Buchholz & Roth 23). This complementary nature, according to Ryburg (93), requires teams that have collaborative communication, are cross-functional, and are responsible for a product or service from concept through delivery. The members are functional experts and participation in the team becomes part of their primary duties (Holmes 5-9).

One final attribute worth noting concerns the size of the team. In the cases the author looked at, most teams ranged in size from five to twelve members. A 12-person section is the basic organizational unit in Japanese companies (Peters, 1987) and the military continues to use 8-person squads. A study by Alexander, Ishikawa & Sliverstein (713) shows that this may be due in part to the fact that the size of the group influences both the number of people who never participate and the number of people who feel they have ideas which they have not been able to express. In their study at the Berkeley, California, city hall, workers preferred groups that ranged in size from two to eight. This may be due to physical limitations to group size. The established upper range for use of conversational voice was 8 feet and details of facial expressions are seen by a person with 20/20 vision up to 12 feet. Also, clear vision includes a range within 12 degrees horizontally and 3 degrees vertically which translates into one human face at 10 feet. Given these parameters, Alexander, Ishikawa & Silverstein argued that group discussions will function best if members are arranged in a rough circle 8 feet in diameter (714). Since average seating space is nearly 27" and a seating circle with an 8 foot diameter has a 302" circumference, no more than 12 people could sit comfortably around such a circle.

Benefits of High-Performance Teams. As organizational units, the Quality Air Force movement considers teams key to the service's future. Some of the advantages of teams include increased levels of trust and commitment and superior quality (Holmes 5-7). Outside the Air Force, manufacturing and service industries are beginning to embrace the team concept "as a way

of maintaining a competitive edge" (Wellins & George 27).

Bassin (64) presents several benefits of teams: increased integration of individual skills and resources, greater energy compared to individuals, increased emotional support, better performance and greater innovation, greater commitment to team goals, and more sustained effort aimed at reaching goals. An example is the self-managing team concept used at the Aid Association for Lutheran's (AAL) headquarters. Under this concept of self-managing teams, the time required for AAL staff to process an insurance claim fell as much as 75% (Hoerr 66).

Working in the Physical Environment

The Challenge to Architects. With this shift, architects must be ready to respond to the complex environmental needs of high-performance teams. As Tom Peters puts it "Space management may well be the most ignored and most powerful tool for inducing change, speeding up innovative projects and enhancing the learning process in far-flung organizations" (412). Architect Ziva Frieman believes that the "design of space conducive to team work and the incorporation of communal and public spaces that effectively increase interaction among colleagues" (54) is the foremost challenge facing architects today. In addition to structural changes in the management of the work force, architectural solutions are clearly needed that support the unique requirements of high-performance teams.

Why is the Physical Environment Important? Before attempting to look at physical responses to the needs of teams in the workplace, it is important to understand that the environment does impact behavior. Who we are and what we are is "expressed not simply by one's relationship to other people but also by one's relationships to the various physical settings

that define and structure day-to-day life" (Deaux, Dane, & Wrightsman 404).

Two different views of this place-identity theory are worth noting. The first, environmental determinism, sees the environment as exerting a powerful, determining force on human behavior. The physical world reinforces human behavior much like steel reinforces concrete. The second

perspective sees the person, and the social and physical environments as codependent. This theory of transactionalism holds that all three of these areas exist concurrently (384).

Spreckelmeyer goes further in arguing that the environment provides a basic level of support and is significant in those instances that impede or interrupt the work process (200). How does the environment interrupt the work process? Simply put, environmental stressors affect the quality of work produced. This stress in the workplace may exact a heavy toll on organizations. ONeill (35) found that stress related complaints account for 75% of the visits to primary care doctors in the United States. As ONeill observed, these stress reactions carry health risks ranging from heart disease to musculoskeletal problems and any modification to the environment that reduces stress would be beneficial. A study of nearly 8000 workers in over 100 companies by the Buffalo Organization for Social and Technological Innovations found that a supportive workplace translates into dollar value benefits of 3% to 20% of salary annually for all categories of employment (Frieman 51).

Changes to the physical environment in support of work teams can be thought of in two ways. First of all, environmental stressors that contribute to one's level of stress within that environment must be removed. Secondly, architectural strategies that positively impact behavior while

responding to the unique needs of teams must be implemented.

Environmental Stressors

Air Quality. Poor air quality is the most common environmental stressor (Lockwood 19). With an increasing focus on tighter buildings with fewer air changes per hour between the building and the outside environment, indoor air pollution is becoming a widespread problem. Contaminates like carbon monoxide, detergents, formaldehyde and other chemicals, microbes, and material off-gassing all contribute to poor indoor air quality, which can lead to respiratory and musculoskeletal problems (ONeill 43).

Frequently, opening a window can alleviate much of the problem. Sadly, many buildings do not include operable windows. In these instances, properly calibrated air changes within the mechanical system, coupled with regular inspection and maintenance of filters and ducts, can help alleviate the problem. Also, increasing passive airflow in the work space by leaving the tops and bottoms of walls or panels open and creating aisles of airflow can improve air quality (42).

Temperature. Depending on the ambient temperature and humidity, workers may be experiencing discomfort or stress. Numerous studies have shown a link between high temperatures and increased levels of violence and a link between cold temperatures and reduced levels of activity (Deaux, Dane, & Wrightsman 387). The problem is that one mechanical system must satisfy the diverse needs of numerous occupants.

Appropriate temperature and humidity controls must be part of every building. To respond to the demands of many users, Johnson Controls is developing a system that allows individuals to adjust the temperature at their workstations (Lockwood 29). Moreover, Steelcase is experimenting with an enclosed workstation that has its own environmental controls.

Noise. Noise is another environmental stressor that can affect interpersonal behavior. Because of its potential to create stress and hypertension, noise influences interpersonal interactions (Deaux, Dane, & Wrightsman 388). Unwanted noise in the workplace leads to increasing levels of stress and can produce narrowed attention spans and cognitive overload, both of which impact behavior (409). Sundstrom and his colleagues (Sundstrom, Town, Rice, Osborn, and Brill 196) found unwanted sound to be a serious problem for office employees especially in light of the documented adverse effects of job-related stress. In a survey of 2391 office workers at 58 sites, 54% said they were bothered often by noise, especially by telephones and people talking (195). Apple Computer moved 2000 of its software engineers from open offices to private offices because they found that one interruption lead to a 15-minute restart period (Stellingsma). Office noise is a problem that will get worse as more knowledge workers, who need acoustical privacy, tap on keyboards in the near-term and dialogue with their computers in the long-term.

Other than the expensive approach of providing private offices for all employees, designers can use certain strategies to reduce ambient noise. First, carpeting can reduce sound levels in offices (Sundstrom, Town, Rice, Osborn, & Brill 217). Next, designers should create office environments that keep noise levels under 55 decibels. Fabric panels, acoustic ceilings, and smaller floor plates

are techniques that can be used to keep noise levels down.

Light. Light levels, like unwanted sounds, have been associated with stress levels (Deaux, Dane, & Wrightsman 390). Researchers have discovered that conversational volume and selfdisclosure directly relate to the lighting levels (390). Moreover, glare, which leads to eyestrain, headaches, and lowered productivity, is the most common problem encountered with office lighting today (Kruk 527). As we move further into the information age, more employees will be working continuously at their computers. Engineers designed the standard office lighting scheme of fluorescent down light fixtures for the paper-intensive office of the 20th century. Computer monitors have disrupted the equation and demand a different type of approach.

Indirect lighting is becoming a more widely accepted solution to the problem of glare (527). Also, by reducing the ambient indirect light to 50 footcandles rather than the standard 70 footcandles, and providing employees with adjustable task lights, lighting engineers can meet the

needs of the electronic office while lowering the overall bill for electric service.

Density. Employee density relates to perceived levels of crowding in the workplace. As people move into smaller work areas, they will begin to experience crowding. People feel crowded when they come into unwanted contact with others. This can occur in an open office just as easily as it can occur in a nightclub. Daniel Stokols is noted by Deaux, Dane, & Wrightsman as saying "Crowding is experienced by people in primary environments such as workplaces or homes where they spend large amounts of time while relating to others on a personal basis and engaging in a wide range of personally important activities" (396).

Responses to crowding in the environment have been varied. Some approaches seek to minimize the number of people in a given space while others focus on the layout of the space. One study by Baum and Valins of college dormitory residents compared those who lived in a corridor plan to those who lived in a suite plan. The bedroom sizes were equal and the number of students per floor was about equal. The main differences were that the suite occupants had a small living room and a bathroom for 6 residents rather than 34. The corridor residents had rooms that opened directly into the hallway. Residents of the corridor building complained more about undesired social contact and crowding.

Taken together, these stressors in the workplace lead to health problems that are emerging as a serious concern and are directly impacting employee productivity (Kruk 527). Kruk reports that data is accumulating relating to "an increase in the number of reports of carpal tunnel syndrome, lower back pain, eye strain and other physiological and psychological ailments due to the stress of

working in automated offices" (527).

It is not enough to remove these negative stressors. New design strategies are required to support the emerging work styles of high-performance teams. There are three factors to consider when designing team spaces: privacy, communication, and flexibility.

Meeting the Architectural Needs of High-Performance Teams

Privacy. The success of high-performance teams rests in large part on the understanding of the value of the individual to the team's goals (Holmes 2-6). And respect for the individual comes through recognizing their skills and contributions (2-6). These contributions result from individual activities such as reading, writing, editing and analysis that require a quiet, reasonably private work area. As Steelcase CEO Jerry Myers states, in the team offices of the future "there has to be space for individuals to retreat from those teams to their individual work areas" (Lyne 954). The privacy associated with these work areas is often a factor in job satisfaction and jobrelated stress (Deaux, Dane, & Wrightsman 393).

Privacy can be defined as "the extent to which one perceives control over contact with or information about one's self or group" (392). When employees receive unwanted intrusions from coworkers, their privacy is being violated. If this occurs, and people cannot regulate their

privacy, stress may result (393). Vinsel, Brown, Altman, & Foss found that freshman college students who dropped out for nonacademic reasons used fewer means of privacy regulation, including shutting their door, finding a quiet place to study, and arranging their room for privacy. Regulating the amount of privacy is important because it allows people to enforce control over knowledge others may have of their actions and hence limits the power others may have over them (Deaux, Dane, & Wrightsman 392).

In the office environment, the predominant solution of the open office is exactly what it means -- open. Continuous interruptions caused by the inability to regulate privacy in terms of distractions and unwanted guests lead to frustration (Lockwood 20). However, architecture can provide employees with a method of regulating their exposure to others without resorting to the Apple solution of private offices for all. Users associate privacy in offices with workspace enclosure (Deaux, Dane, & Wrightsman 409). Although workers in open office plans report dissatisfaction with their lack of privacy, their performance depends on task complexity (Block & Stokes). Generally, simple tasks appear to be unhindered by a lack of privacy while the performance of complex tasks suffers. Similar findings reported by ONeill (21) suggest that designing an adequate sense of enclosure for knowledge-based tasks could reduce stress while increasing worker satisfaction with the space.

The architecture should allow for the different and variable privacy needs of individuals and teams. Although private offices with lockable doors correlate with job satisfaction (Spreckelmeyer 183), less severe measures may work. For example, private alcoves that allow for individual work free from observation can be provided off a common team work area. Since there seems to be a positive correlation between the number of sides of the workspace bounded by walls at least 6 feet high and perceived privacy (Deaux, Dane, & Wrightsman 394), these alcoves could have 6 foot panels or walls enclosing two or three sides. To accommodate the dual needs of privacy and communication, work areas can be created that provide visual privacy when

facing one direction but team interaction when facing another direction.

As noted by Baum and Valins, problems arose in dormitories where private rooms opened directly onto public corridors. In designs like this, occupants have little control of sequencing their privacy. Much like stoops and front porches allow for a transitional space between increasingly public spaces outside the home to increasingly private spaces within the home, so

should transitional spaces within buildings allow for privacy sequencing.

Communication. As important as privacy is, communication and collaboration are equally important in team environments. Part of the charge for leaders in the Quality Air Force is to facilitate communication among and within teams of all types (Holmes 1-5). Recall that one of the attributes of a high-performance team is collaborative communication. That is communication that is two-way and informative and builds on the ideas of others to get real work done (Ryburg 96). It necessarily means a high degree of interaction and requires that members work together with their teammates rather than alone. While enclosed offices are ideal environments for privacy, they do little to enhance communication between team members. Establishing a strategy that supports interaction among team members begins with evaluating just what type of communications takes place within a team.

In his study of 28 organizations restructured around team-based management principles, Ryburg (97) noticed three patterns of high involvement communications that existed in these teams: planned, spontaneous, and fortuitous. First, planned or scheduled communication usually took place in formal meeting rooms. Second, sharing spontaneous insights and/or other complimentary information impacting the team was a constant occurrence in the teams Ryburg studied. The case study teams witnessed a 3-4 fold increase in the need for spontaneous communication (97). Common complaints centered around the fact that team members "were too walled-off from each other to effectively communicate spontaneously" (98). The third type of communication was fortuitous. Accidental encounters occurred in lobbies, aisles, and common areas and were seen as valuable to meeting the team's objectives. Spontaneous and fortuitous communication can also occur at drinking fountains, coffee counters, restrooms, and common equipment spaces. This was so important that Ryburg found the case study companies actually programming in space for fortuitous communication in their new buildings (98). At Steelcase's

new Corporate Development Center, employees work in "neighborhoods, with marketing, manufacturing, and design workers in close proximity to encourage discussion of ideas and problem-solving" (Lyne 957). Within weeks of their move to this facility, managers noticed a decrease in meetings and a more effective informal communication flow (Peters, 1992, 414).

Part of communication is listening and Peters (1987) believes that listening is actually the critical component of the communication equation. To foster teams, he suggests an environment be created where listening is "cherished" (367) and where opportunities for planned and spontaneous listening are profuse. In his studies of quality corporations, he found the most successful high-performance teams always had well-equipped areas for listening and problem-solving. Alexander, Ishikawa & Silverstein call these areas "sitting circles" (858) and believe they should be roughly circular because that is how people arrange themselves in groups. These circles need spatial definition with aisles placed at a tangent "so that people naturally pass by it, stop and talk, lean on the back of chairs, gradually sit down, move positions, and get up again" (859). These team spaces work because they encourage interaction through seating that allows eye contact (Sommer 124). Contrast this with the standard office 4-bay system workstation that discourages communication and eye contact.

The author believes that strong, high-performing teams are more than collections of workers. The best teams may consist of friends with shared visions and interdependent needs. Since physical proximity often relates to enhanced interpersonal friendships (Deaux, Dane, & Wrightsman 402), architects should create cohesive team neighborhoods that enhance proximity. Several studies reported by Deaux, Dane, & Wrightsman (403) indicate that among office

employees, conversation partners and friends occupied nearby workstations.

In his book Rebirth of a Corporation, D. Quinn Mills sums up what clusters or high-performance teams need. They "need an environment in which people can see one another easily and therefore are encouraged to communicate. In the past, companies wanted to avoid this situation believing that when people were talking they were taking time away from work. But as work comes to involve ... more judgment about specific situations, efficiency can be increased when people consult quickly about how best to handle circumstances" (Peters, 1992, 414).

Flexibility. Providing flexible environments to support the changing needs of the high-performance team must be a high priority for architects. As projects come and go so to will the teams assigned to the projects. The team's function and size may change overnight and with little notice. Flexible designs can minimize disruptions when reorganizations occur while facilitating the quick alteration of space to meet the needs of project teams (Brennan & Whistler, 26). Vivian Loftness of the Advanced Building Systems Integration Corporation asserts that "the key issue is not so much which solution is the one for an organization, but how to establish the infrastructure to support constant change" (Freeman 88).

The failed approaches to flexibility utilize either entire floors of uninterrupted, freestanding office furniture or partially enclosed workstations using prewired modular systems furniture. The former allows for minimal privacy and group cohesion (Alexander, Ishikawa & Silverstein 190) while the latter is such a burden to move that change rarely occurs. In fact, moving a prewired workstation costs \$500 to \$600 (Lyne 966). When added to the initial unit workstation cost of \$4,000 to \$5,000, it becomes less expensive to build and modify gypsum board partitions and use

free-standing furniture.

Approaches to the problem of flexibility for team spaces vary. One approach calls for team spaces with furnishings users can easily arrange to meet the needs of varying tasks and groups (Herman Miller, 1990, 3). Another method calls for installing permanent electrified panels that act as a spine for the attachment of modular worksurfaces (Brennan & Whistler 28). A similar approach utilizes a core worksurface with utility connections. Modifications occur with the installation of additional, more flexible components and panels (28).

Fortunately, technology continues to help in this arena. Motorola is developing wireless and battery powered products that will provide greater flexibility in the future (Lyne 963). Imagine returning to work on Monday morning with a recharged laptop computer and a portable cellular

phone both linked to the wireless network.

A Model for the Future

Learning from the Past. The future's workplaces still leave designers with the issue of creating flexible space for teams. Alexander, Ishikawa & Silverstein offer a clue to a unique approach to office flexibility worth studying. They found that organizations that reuse homes are generally pleased with the spatial configuration. The reason is simple. These old homes have many small rooms and partially defined spaces connected in a variety of ways. Although "these spaces were designed to support family life, they turn out to support the natural structure of work groups: small spaces for private and half-private offices, slightly larger spaces for work groups of two to six, usually one space where up to 12 people can gather, and a commons centered around the kitchen and dining area" (692). Although the walls cannot change instantly, flexibility can occur by simply opening or closing interior windows and doors.

While not altogether appropriate for Air Force projects, Kruk translates this pattern into "activity settings" (525). A variety of these settings support limited ranges of activities and replace the all-encompassing workstation. They "emphasize serving the shared needs of work teams" (525). Activity settings divide the physical environment into units that respond to the varying team needs. This supports Alexander, Ishikawa & Silverstein's belief that institutions should subdivide into small, spatially identifiable teams arranged so that each member is in at least partial view of the other members of the team (703). They add that "people will feel oppressed, both when they are either working in an undifferentiated mass of workers or when they are forced to work in isolation" (702). In addition, the common areas will counterbalance the ill effects of isolation felt in many office environments. The author believes the key activity settings for knowledge-workers and their high-performance teams are individual alcoves, team spaces, and

neighborhood commons.

Individual Alcoves. The individual alcoves are collocated and adjacent to the team commons and they contain a work area and individual storage space. Adequate storage and display space within the alcove is essential according to ONeill because storage is the most important predictor of satisfaction with individual work settings (37). The alcove is a small area for individuals to work on computers, drawing boards or worksurfaces while allowing them visual and verbal connection to the other team members. Collocation of workers in a team setting is essential. At the Honeywell corporation's Commercial Flight System facility, team members said to managers "[if] ...you want to get the maximum output, put us together ... Make it so I don't have to call you; you're right over there" (Benson 49). Honeywell responded by giving interdepartmental team members spaces adjacent to one another (49). Steelcase's Personal Harbor is an example of an alcove approach to private areas. It is an enclosed 48-square-foot work pod with a small horizontal worksurface and a technology tower that incorporates a CD, flat panel display, computer, telephone, and climate control panel. On a more open note, facility designer Darrell de Tiene suggests that the first implication of high-performance team structures is that the private workstation no longer works alone but "extends past the four furniture partitions to project space" (Herman Miller, 1990, 1). He adds that since people will be spending most of their time in teams, they "have less need for a self-sufficient workstation than they have for a variety of team settings" (1). A balance between the two approaches can be found utilizing standard 6-foot high partition walls that enclose two or three sides of the alcove while leaving the remaining sides open to the team area to facilitate interaction.

Within the private alcoves, adaptable individual workstation components should be provided. Adjustable worksurfaces, computers, chairs, storage devices, and task lights can improve control over the work process by allowing personalized changes to be made to fit the work at hand. Ergonomic legislation in San Francisco actually mandates the use of adjustable keyboards, displays, documents holders, and seating (Kruk 528). Most studies show that employees' ability to control and personalize their work setting is a significant factor in determining worker "perceptions about their work environments" (Spreckelmeyer 183). Moreover, the study by ONeill found that a significant predictor of stress was the amount of control workers had over the furnishings, lighting, and equipment in their areas (34).

Office policies that inhibit personalization of desks, lockers or workrooms should be removed. That may mean simply allowing the display of photographs, posters or other personal belongings. Or it may mean replacement of fixed furnishings. In the end flexibility benefits team members because personalization of the work setting correlates with higher job satisfaction (Deaux, Dane,

& Wrightsman 407).

Team Space. The team space is the central work area. It is designed to create a distinct team area. Apple Computer calls these spaces "user-definable areas" or UDAs (Stellingsma). These UDAs adjoin several private offices and they incorporate a variety of soft, movable furnishings. According to Alexander, Ishikawa & Silverstein, these common areas should be at the "center of gravity" (618) of the team and they should have tangential paths running in and out connecting the team commons to the larger organization. Steelcase's approach to furnishing the team commons uses interlocking, interchangeable furniture and freestanding columns that support whiteboards, display panels, and acoustic partitions. According to Steelcase CEO Jerry Myers, "the whole concept behind Commons and Personal Harbor is to create team and private settings and use no more space than in a typical (80-square-foot) dedicated workstation" (Lyne 958). The commons area may have a sitting circle, shared resource files, joint-use equipment, and communication tools like whiteboards and screens. Together, the alcoves and commons facilitate small work areas that office workers prefer (Alexander, Ishikawa & Silverstein 690).

At Aetna Life and Casualty's headquarters in Hartford, Connecticut, designers divided a vast open-office layout into smaller departments using a standard combination of private and semi-private offices. According to Bordenero, the "solution helps divide the floor plates into small

sections which reflects Aetna's policy of emphasizing group interaction" (54).

Neighborhood Commons. The neighborhood commons "serve as a backdrop and link to the larger society within the organization" (Picasso 57). They begin to act like the front porches of yesterday. The commons or shared activity settings may serve several teams, and they may provide space for restrooms, video conferencing, shared equipment, and planned meetings. As Frieman points out, architects for the Chiat Day advertising agency in Santa Monica, California, placed a clubhouse at the heart of the facility "with playful furnishings casually arranged for a free

exchange of ideas" (51).

The commons begin to tie teams together. They can be lounge areas, auditoriums, cafeterias, lobbies and hallways, or meeting rooms. More meeting rooms in a number of neighborhoods can be kept to a smaller size and they can be kept closer to the participants' work areas so that discussions begun in the meeting can continue in the team area (Alexander, Ishikawa & Silverstein 715). They become settings for all types of communication that spark creativity and progress. At the 3M electronics plant in Austin, Texas, designers used the architecture to enhance spontaneous and fortuitous communication by mixing functional units, and placing couches, coffee machines, and blackboards next to restrooms (Peters, 1992, 379).

The variety of these activity settings supports the variety of high-performance team activities. As team members move from task to task, they can move into the various activity settings that

support those tasks.

An Opportunity

The move to high-performance teams is underway. Leaders throughout corporate America who recognize the numerous benefits of using these self-managing, interdependent teams are changing organizations and processes to support their knowledge workers of the next century. However, to be truly effective, these teams need more than a streamlined organizational chart. They require work areas free of environmental stressors. They need spaces that support intense individual work, collaborative team work, and interdepartmental interchange. Finally, they need an architectural environment that responds to the team member's need for privacy, communication and flexibility. Taken together, these strategies present an opportunity for designers and managers to respond to the unique needs of high-performance teams.

References

- Alexander, C., Ishikawa, S., Silverstein, M. A Pattern Language. New York: Oxford, 1977.
- Bassin, M. "Teamwork at General Foods." Personnel Journal 5 (1988): 63-70.
- Baum, A., & Valins, S. Architecture and Social Behavior: Psychological Studies of Social Density. Hillsdale, NJ: Erlbaum, 1977.
- Benson, Tracy. "A Brave New World." Industry Week 8 (1992): 48-54.
- Block, L., & Stokes, G. "Performance and Satisfaction in Private Versus Nonprivate Work Settings." Environment and Behavior 21 (1989): 277-297.
- Bordenero, M. "Headquarters Turns Floor Plans Outside In." Building Design and Construction 3 (1991): 54-57.
- Brennan, H. & Whistler, W. "Designing for Flexibility." Building Design and Construction 11 (1990): 26-28.
- Buchholz, S. & Roth, T. Creating the High-Performance Team. New York: John Wiley and Sons, 1987.
- Deaux, K., Dane, F., Wrightsman, L. Social Psychology in the 90s. Pacific Grove, CA: Brooks Cole, 1993.
- Freeman, Z. "Hype vs. Reality?" Progressive Architecture 3 (1994): 48-55.
- Herman Miller. An Introduction to Project Team Management. Zeeland. MI: Herman Miller. 1989.
- Herman Miller. Facilities for Project Teams. Zeeland, MI: Herman Miller, 1990.
- Hoerr, J. "Work Teams Rev up Paper Pushers." Business Week 11 (1988): 64-72.
- Holmes, S. ed. The Quality Approach ... Your Guide to Quality in Today's Air Force. Maxwell AFB, AL: U.S. Air Force, 1993.
- Kruk, L. Office 2000: Planning for Evolution. NeoCon93 Proceedings. Chicago, IL: NeoCon, 1993: 513-533.
- Lockwood, S. "Creating a Productive Office Environment." FM Journal 3 (1992): 317-320.
- Lyne, J. "Creating the Office of the Future." Site Selection 10 (1992): 954-968.
- Markoff, J. "Where the Cubicle is Dead." The New York Times 25 April 1993: A7.
- Olson, C. "Chrysler Constructs the Ultimate Advantage." Building Design and Construction 9 (1992): 24-29.
- ONeill, M. Designs for Reducing Stress in the Environment. NeoCon93 Proceedings. Chicago, IL: NeoCon, 1993: 33-43.
- Peters, T. Thriving on Chaos. New York: Harper Collins, 1987.
- Peters, T. Liberation Management. New York: Alfred A. Knopf, 1992.
- Picasso, G. Social Issues Affecting Workplace Design. NeoCon93 Proceedings. Chicago, IL: NeoCon, 1993: 53-61.
- Ryburg. Technical Integration for New Offices Patterns and Spaces. NeoCon93 Proceedings. Chicago, IL: NeoCon, 1993: 93-99.
- Sommer, R. Personal Space: The Behavioral Basis of Design. Englewood Cliffs, NJ: Prentice-Hall, 1969.
- Spreckelmeyer, K. "Office Relocation and Environment Change." Environment and Behavior 2 (1993): 181-204.
- Stellingsma, E. Personal interview. April 1994.
- Sundstrom, E., Town, J., Rice, R., Osborn, D., Brill, M. "Office Noise, Satisfaction
- and Performance." Environment and Behavior 2 (1994): 195-222.

 Vinsel, A., Brown, B., Altman, I., & Foss, C. "Privacy Regulation." Journal of Personality and Social Psychology 39 (1980): 1104-1115.
- Wellins, R. & George, J. "The Key to Self-Directed Teams." Training and Development Journal 4 (1991): pp. 26-31.
- Whitaker, M. "The Future of the Workplace: Less Monolithic, More Pluralistic." Industrial Development 5 (1992): 1-5.

Team Building Technology for the 21st Century



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TEAM BUILDING TECHNOLOGY FOR THE 21ST CENTURY

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ABSTRACT

The Air Force Operational Test and Evaluation Center reorganized from a traditional functionally matrixed structure to a product team based organization in response to a substantial workload increase with few increased resources. To facilitate this change, the Center developed a team building approach designed to foster open communication within the product teams. The initial workshop in this approach is an experiential "in-side out" learning opportunity that provides tools to the product team which enable them to develop intra-team communication and mission focus. These tools include a team assessment instrument, a tool to foster individual and team understanding of each member's talents (the Myers-Briggs Type Indicator), a structured feedback model, decision making and problem solving tools, and a process check instrument. Exercises and discussions ensure the team members understand and can apply these tools. "Real world" business meetings are included in the three day workshop so teams can apply the tools to workplace issues. At the conclusion of this workshop, teams have developed a mission statement and vision, assessed their current situation, clarified individual roles, and set team goals. The philosophy and conduct of this initial workshop are the subjects of this paper.

BACKGROUND

The Air Force Operational Test and Evaluation Center (AFOTEC) is a Direct Reporting Unit responsible for planning, conducting, and reporting the results of operational test and evaluation (OT&E) for all Air Force weapon systems. In March of 1992, the Center assumed responsibility for conducting all Air Force OT&E. Before that date, the Center planned and conducted major program tests and exercised management oversight of the smaller programs conducted and reported by operating commands. This expanded role increased the number of active test programs from approximately 40 to more than 200, with little increase in manning and resources. The workload increase necessitated a different organizational structure than the functional matrix that had been in place for more than 17 years. Coincidentally, the Air Force introduced the concepts of teamwork and continuous improvement service wide. AFOTEC senior leaders saw these two events as the basis for fundamentally restructuring the Center into a product team based organization.

The transition to teams did not come automatically. The skills necessary to be effective and successful as team members are not the same as those required in a traditional functional staff. For example, Larson and Lafasto in Teamwork, What Must Go Right/What Can Go Wrong report the single common factor among successful teams they researched was the presence of clear elevating team goals. This same factor is practically non-existent in the typical

Air Force staff office. In addition, team members depend on each other to a far greater degree than the standard action officer.

Rather than working independently, teams are expected to work interdependently, using all the talents present among the members. Collaboration, rather than competition, is the norm. Stephen Covey, in The 7 Habits of Highly Effective People, makes the point that seeking "winwin" outcomes is a characteristic of those he defines as effective. The same is true of effective teams. Because the skills required of a team member are different than those of a typical action officer, many Air Force members have never had the opportunity to develop them.

To mitigate this situation, and to provide the greatest probability of success for the new structure, AFOTEC developed a series of workshops to build the individual and group skills necessary for effective teaming. The initial workshop in this series, a three-day experiential introduction of those skills, is the subject of this paper.

OVERVIEW

The model used for the workshop is one of "inside-out" learning. That is, the material presented focuses first on the individual to provide each person with an easily applied tool that enables them to understand their motivations and preferred methods of interaction. This same tool is used to introduce the intrinsic barriers to communication between two individuals present simply because they are different. Finally, the workshop explores the opportunities and difficulties these differences present when communication must occur between more than two people. For simplicity and continuity, the same model of individual preferences is used throughout the three days and in subsequent workshops. The tool used to introduce and develop that model is the Myers-Briggs Type Indicator or MBTI.

The MBTI was chosen for several reasons. The first was availability. To become certified to use this instrument is a fairly simple matter of attending a five day seminar and passing a qualifying examination. The second was cost. Administering the instrument costs only 10 to 15 dollars per individual, not including the cost of certifying instructors. We also considered the amount of data available on other MBTI participants to be a significant positive factor. Finally, the pervasive use of this instrument at other Air Force organizations and civilian concerns made the MBTI a more standard and therefore more transportable tool than other similar technology.

There are drawbacks to the MBTI. Most concerning is the inappropriate use of the instrument. The underlying theory on which Isabel Myers and Katherine Myers-Briggs constructed the instrument speaks of "preferences" and does not predict specific behaviors. Many MBTI practitioners give the impression that type preference is prescriptive. Due to the large exposure of the general population to the MBTI, we anticipated that several team members would have experienced this misapplication and be reluctant to participate. To address these preconceptions the module introducing the MBTI is structured to emphasize the value of diverse personality preferences and the non-prescriptive aspects of type.

AFOTEC's initial team building workshop is a three-day (24 classroom contact hours) experiential learning activity with the educational objectives of developing team cohesion, focus, and inter-personal communication skills among the members of intact work teams. The course is divided into presentations by the team building facilitators, group exercises to more fully develop concepts introduced in those presentations, exercises to reinforce the practical applications of concepts, and team meetings where actual work related business is discussed. The workshop agenda is shown in Figure One.

WORKSHOP AGENDA

Day One	Day Two	Day Three
Opening	Opening (Universe Exercise)	Opening (Sharing Affirmations)
(Icebreaker/Exercise)		
Team Assessment Exercise	MBTI Homework Exercise	Visisoning Exercise
Understanding the Team	Decision -Making and	Competition/Collaboration
(MBTI)	Problem Solving Models	Exercise
Team Communications	Production/Process	Giving and Receiving Feedback
	Capability Exercise	
Team Meeting (Mission)	Team Meeting (Current	Team Meeting (Roles)
	Reality)	
Closing (Critiques)	Closing (Critiques)	Follow-on Team Building
		Presentation
		Team Meeting (Goals)
		Closing (Team Picture)

Figure One.

WORKSHOP DETAILS

Preparation. Prior to the workshop, the team building facilitators (always a two-person team), meet with the team leader to discuss expectations for the workshop. At that time the team builders gather information on the make-up and mission of the team. They also ask for the team leader's perceptions about how the team works together and if there are personality or physical problems that could affect the workshop. Finally, the team builders schedule a team meeting, for all team members, to brief them on the workshop.

During this meeting, the team is informed of the location, time, and dress for the workshop. The team leader presents his expectations and explains his/her rationale for asking for this intervention. The team builders administer a team effectiveness survey for use during the workshop and then introduce the MBTI. First and very clearly, the team members are told MBTI participation is voluntary. If they do choose to participate, the information will be protected in accordance with Privacy Act standards. A short explanation of the MBTI theory and uses during the workshop follows. Finally the instrument is administered and collected. In almost two years of team building for over 500 participants, no one has declined to participate.

After the team leader interview and team pre-brief, the team builders begin preparations for the workshop. The team assessments are scored and the data formatted for use by the team. The MBTI is scored and a team type table is produced. Based on the response to the MBTI, individuals are chosen to illustrate type preference behaviors during the MBTI presentation. The team builders divide workshop responsibility and decide on which exercises will be most effective for that team. It is very important for all team members to be present and not distracted by the day to day pressures of routine work. The workshop will not occur if all team members cannot be scheduled to attend.

Day One. The first module of the workshop sets the tone for the remainder of the three days. Introductions begin with the team builders and progresses to a team introduction exercise. Several are available from published sources including <u>Games Trainers Play</u> or <u>The Encyclopedia of Icebreakers</u>. The exercise selected should emphasize the informal atmosphere of the workshop and encourage self disclosure.

The second module demonstrates to the team why they need a team building workshop. The exercise illustrates our cultural tendency to work individually rather than as a team. The module is introduced with a script that requires the team builders to use the term "team exercise" at least five times. A simple problem is presented to the team members via individual sheets of paper. During this exercise, intervention by the team builders is usually required to bring the team into the group problem solving mode; the default mode is generally individual action in a silent environment. The debrief centers on finding possible reasons for this default mode and surfacing methods which will allow the team to overcome this bias when group problem solving or decision making is appropriate.

The next module introduces the results of the team assessment accomplished at the prebrief session. The instrument used is included in the appendix. The team is separated into three or four (depending on team size) consulting groups with the task of analyzing and reporting the results of the assessment. Each group then reports it findings and recommendations back to the entire team. The team builders then relate these findings to the specifics of the course agenda, emphasizing where each recommendation will be addressed. This module sets the expectations for the team meetings included in the agenda.

The fourth module introduces the underlying concepts of the MBTI. During this two and one-half hour presentation, the team builders introduce the idea of diverse preferences as defined in C.A. Jung's theory of personality types. Each of Jung's preference axes is presented with examples of behaviors that are associated with each preference. The concepts of "talents" and "gifts" is continually reinforced throughout the presentation. Each team member is encouraged to discuss how these preferences could manifest itself in the work place. The team builders, at least one of who is certified in the MBTI, facilitate discussions about the application of type theory to individuals. The output of this module is an understanding of what type is (and is not), and a self validation of each team member's individual type. Once validated, team members are offered the opportunity to share their type profile with the team.

The fifth module uses the MBTI as a basis for improving inter-personal communications. The team builder introduces a simple model of effective communications. During the presentation, barriers to effective communication are developed centering on our tendency to

attribute failed communication to the differences between sender and receiver. These differences are often seen as negative because we do not have the means (tools or time) to analyze why the differences are present and how to overcome them. The team then participates in an exercise illustrating the various communications modes preferred by team members with differing dominant Type functions. The exercise debrief again emphasizes the need for diversity and allows team members to identify methods to reduce communication barriers caused non-homogenous groups. A work-at-home activity designed to reinforce the MBTI information is assigned.

At the end of day one the team is given the opportunity to use the skills they have learned and the data from the team assessment in its first team meeting. The purpose of this meeting is to develop a draft team mission statement. The team is asked to identify its suppliers, products, and customers and to explain what value the team adds to the organization's overall mission. The team's mission statement should explain what the team does to justify its use of AFOTEC resources.

The day one closing is a simple exercise that illustrates the increasing complexity that accompanies a team of increasing size. After this exercise, team members are asked to share one word which to them describes the day's activities. Finally, team members are asked to provide written critiques on the day.

Day Two. The second day of the initial team building workshop begins with a review of the critiques from day one. Trends are noted and areas for improvement are emphasized. Team builders thank the team members for their inputs to make the course better for future teams. The team then participates in a "right-brain" exercise designed to let individuals learn more about each other.

The next module reinforces the communication process and preferences discussed on day one. The team is separated into four groups and each group is asked to prepare a letter which should result in action on the part of a famous personality. The letters, along with the dominant type function of the personality, are presented and discussed.

The next three modules illustrate the characteristics and difficulties of group problem solving and decision making. During this time the workshop is designed to distract the team from any singular activity, simulating a typical work environment where many things are going on at once. After a presentation on problem solving, effective decisions and various decision-making methods, the team is asked to participate in an exercise to illustrate group member perceptions of several decision methods. Before this exercise is complete, another exercise is started which introduces ambiguity of desired outcome to the team. At the conclusion of both exercises, the team is allowed to determine whether of not it reached effective decisions based on characteristics it developed earlier. The processes used during the exercises are compared to the ones offered as models, and the team evaluates the effectiveness of the process it used.

After the team is satisfied it has assimilated the group decision making and problem solving models and their applications, the next module allows it to practice these techniques.

The team is separated into three groups with each group asked to perform the same task, planning and executing a simple activity. The ground rules are purposely non-specific to allow for creative problem solving and task execution. The associated rules only dictate a clear difference between task and process activity. Mid-way through the planning function, the groups complete a process worksheet and spend several minutes discussing results. After this enforced attention on process, the groups then return to their planning and proceed directly into execution at the appointed time. During the exercise debrief, team builders ask for the team to relate possible effects of type preference to the observed outcomes. The team is also asked to develop mechanisms to allow all team members to contribute and to use the process evaluation worksheet in its day to day business.

The outcome of the above exercise is used as a vehicle to practice giving and receiving objective feedback among team members. The model used recognizes the difficulty in initiating feedback and provides mechanisms for lowering the perceived threat levels so team members can take action to improve.

After this exercise, the team convenes its second team meeting. The purpose of this meeting is to discuss and formulate a "snap shot" of the team vis-à-vis the draft mission statement developed earlier. Team members are asked to brainstorm what the team is doing well, what is not going well, and how the team is viewed by its customers and suppliers. The team will use this information to develop improvement goals in a subsequent meeting.

The day two closing starts with an opportunity for team members to affirm behaviors of their teammates. Each team member is asked to write three "thank-you cards" to three other designated teammates. Each team member is asked to read the cards that evening and select the one most meaningful to them. They are told they will share that card and their reasons with the team the next day. The next part of the closing is a repeat of the one-word exercise from day one. Team members then complete a feedback critique on the day's activities.

Day Three. The day starts with team members sharing the affirmation they chose the night before. The card may be read or paraphrased and the author's name may or may not be disclosed. The emphasis is on the team member relating to his/her teammates why that particular card was selected.

The team then goes directly into a team visioning exercise. An introductory illustration and presentation emphasizes the importance of a shared vision to the effective functioning of the team. The team is then asked to prepare a vision of the desired future state of the team using a three to five year planning horizon. An additional requirement is levied; the vision produced must be non-verbal in nature. While simple vision statements are not acceptable, pictures, poems, songs, theatrical productions, and other creative approaches are encouraged. The vision should include the team's relationship with its customers and suppliers, team member interaction, product focus, and desired changes in state over the planning horizon. Once completed, the team presents and explains its vision to the team builders.

Next is a team exercise designed to help teams determine the progress they have made over the preceding two days. The team builders introduce a simulation that has ambiguous definitions of success and team grouping. The team is divided into four groups that make independent decisions regarding game play. After the simulation, the team is led through a debriefing focused on how the problem was defined by each group and the results of those definitions. The team is able to evaluate its own tendencies toward collaboration or competition, and formulate ideas on how to address those tendencies.

The remainder of the workshop is spent in team meetings. The first of these provides an opportunity for team members to express individual interpretations of each member's team role. There is also time allowed for team members to share their expectations for other members. A second meeting is devoted to establishing team goals in the areas of mission accomplishment, process improvement, and team work enhancement. The workshop closes with a verbal feedback session, team picture, and recommendations from the team to the team builders.

CONCLUSIONS

The initial team building workshop is designed to introduce teams to the concepts of diversity, collaboration, and process/task behavior balance. The exercises, examples, and presentations are all related to these concepts. It is experiential in nature and the application of the concepts introduced depends in large part to the willingness of the individual to do so. However, the overwhelming view of the workshop's worth, based on end of course feedback, has been extremely positive.

For most military and civil servant attendees, emphasis on team approaches to problem solving and decision making is new and sometimes alarming. The value of diverse preferences and views at times seems counter-intuitive to efficient and effective processes. Integrating this diversity into a functional high performing team is the biggest challenge facing those who choose to lead teams. The workshop described above is just the first step in a long process that has resulted in a more open and productive workplace for AFOTEC team members.

The Critical One Syndrome



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QAF Symposium

1 July 1994

The Critical One Syndrome

There are many ailments to management. Joel Barker mentions Paradigm Paralysis for people who can't see past their values (Barker:1987). Deming cites that quotas and fear can cause organization stagnation (Neave; 341-349). I'd like to mention an illness that has been around for quite some time and yet, receives little attention; The Critical One Syndrome. Allow me to use examples to define this serious condition that effects work sections.

Imagine an office or work section with several desktop computers and perhaps a network or LAN (system of connected computers). Like any office, the people are trained on the significant processes they deal with day-to-day. Also imagine that this office has 14 workers, two managers and a superintendent. Only one person working in the section has had formal training on the computer word processor or database used daily. The rest of the personnel know enough to turn the machine on and print a document. What's wrong with this picture? What happens if the system goes down? What happens when a new employee comes in and needs training because they are not familiar with your particular word processor? What happens if the customer or even policy dictates a new form to be produced? The office is held fast and business stops as they search for the one person who knows how to change the page settings in Wordstar. Sound familiar? Simple tasks such as putting page numbers on documents, changing the size of text, saving information and how to turn the printer on can add up to hours of frustration and wasted time.

Ask yourself this question; how much better could you do your job if you knew how to properly run your computer programs? I'm not talking about high level programming, just being able to use all the functions of a program, such as Enable or Wordstar? The tendency is for the shop to have one, maybe two people who "know" the system who are continuously called upon to help out. What happens if that person is on leave or sick? Training is delayed and if anyone requires assistance on their system, it must wait. This is an example of the Critical One Syndrome.

Let's have another example. A few years ago, a TSgt was applying for the BOOTSTRAP program to finish his degree. Two weeks before his departure to school, he was required to finalize paperwork through his Major Command. This paperwork, at the time, had to be accomplished within two weeks prior to departure and not before. When he attempted to call headquarters to find out when the paperwork would be finished, he was told that the person responsible for coordinating such requests is on 30 days leave and he would have to wait until he returned. Incredible! Only one person at headquarters was capable or responsible for signing this request, and the rules were written to prevent any deviation to that. To resolve his problem, the TSgt drove 300 miles to get one signature so he could pursue his education.

Do you have the Critical One Syndrome in your organization? How can you tell if you have this sickness? If you can answer yes to any of the following questions, you may have contracted it!

- 1. Are there people who have knowledge or skills that are essential to your day-to-day mission or processes in your section and you cannot do without them?
- 2. Have you canceled leave for individuals because of their qualifications?
- 3. Do you have people responsible for critical jobs who do not have a trained alternate?
- 4. Do you have general equipment only a few people know how to operate?
- 5. Have you had to wait on an important decision because the only expert in the section was TDY?

There are certainly limitations we must put on this idea. Many of our people are specialists, trained on very complex and intricate equipment. I'm not saying we can fix all of our problems by training everyone on everything, but we certainly can prevent many heartaches within our sections by being better prepared. Information, forms, equipment and techniques used on a day-to-day basis, need to be familiar to your people.

How can we prevent this illness? Planning and training. If you're expecting a new piece of equipment, new software or a new method or technique to do the job, sit down and plan your moves before you put it into action.

PLAN! Plan for the organization to improve your capabilities. Think how much training, resources and time it will take to fully implement the program. If you skimp on this, you'll feel it later when people are not prepared to do the job. Eliyahu Goldratt in his book The Goal prescribes planning as the method for overcoming bottlenecks within a manufacturing organization (Goldratt; 145). By systematically examining the system to see where critical events happen, we are better prepared to address possible future problems. One method of looking in

detail at a section is Departmental Task Analysis (DTA). By taking each section and identifying all the processes within that section, the manager can get a good look at the work that is done daily. From this detailed picture, you can identify and remove areas of waste and frustration.

TRAIN. There is nothing greater you can do to prevent the Critical One Syndrome than train your people. If there are only two people who know how to operate a piece of equipment, train more! If there is only one person "qualified" to process special orders, train more! Don't leave yourself wide open to the debilitating effects of the Critical One Syndrome.

We don't let critical missions fail! Think about it, do we ever hear the following:

"I'm sorry sir, the Senior Air traffic Controller is on leave, you'll have to fly another day"

"I'm sorry Mr. Hostage-Taker, our negotiator is currently TDY, you'll have to wait for someone properly trained to arrive."

"Yes sir, I realize this is a priority message of utmost importance to national security, however, the person in charge of the processor is out of the office right now and...."

"We realize the inconvenience of this major fire, but, many of our fire fighters haven't been signed off on their training documents on their new oxygen equipment, and I'd hate to ruin these masks just because your home is ablaze."

Ridiculous! Yet, how many times have we been turned away because someone qualified was not available? How many hours has critical paperwork, at least critical to your section, been held at some unknown desk because the clerk was not trained on it? This not pointing a finger at any one section. It's pointing the finger at ourselves, realizing where our weaknesses are and then overcoming them.

Take a hard look at your work station. Use some methods of strategic planning in defining your processes. Plan the use and training of your personnel. Most of all, ask your personnel what wastes time and causes frustration. Often, a DTA can identify these areas. Whatever method you use, make sure it is systematic and detailed. Finally, treat your everyday processes like critical ones. When you know that every process in your section is designed to meet your goals and strategic plan, then you have made progress towards reducing or eliminating the possibility of the Critical One Syndrome.

Works Cited

Barker, Joel. <u>Discovering the Future: The Business of Paradigms</u>. Charthouse International Learning Corperation, Video Training Course, 1990.

Goldratt, Eliyahu M. <u>The Goal</u> 2nd Ed. Revised, North River Press, Inc., New Haven, CT, 1992.

Neave, Henry R. The Deming Dimension. SPC Press Inc., Knoxville, TN, 1990.

The Leader In A Learning Organization



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The Leader In A Learning Organization

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Abstract

This paper introduces a model for leaders who desire to build learning organizations. The model was constructed by integrating research from cognitive science with Senge's proposed roles for leaders in learning organizations. Implications for leaders are discussed as related to the model.

Introduction

What is the proper role of a leader in our complex organizations?

Many would argue that this question is not relevant since historical leadership models still fit quite well in modern or complex organizations. If we define the modern organization as the possessor of the same old wine skin of hierarchical power structures holding new quality wine perhaps it is tempting to think no change is required in our leadership models. If we look at the type of organization described by Peter Senge, which he labels "the learning organization," we see potential handicaps associated when attempting to apply unmodified traditional leadership roles within that environment. Senge defines the learning organization as an entity where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together (3). Even a casual glance at Senge's definition reveals a new world view of the organization and is suggestive of potential leadership roles.

We propose that traditional leadership models were built with a particular world view of organizations, people, and the environment in mind. That world view was based on a mechanical or analytic viewpoint of reality. Early models of scientific management and leadership were born from the work of Frederick Taylor and a Newtonian world view. This world view was built on the premise that human organizations were very much like a mechanical clock, although complex in its parts, could be understood and used properly by understanding and controlling its mechanisms¹. This world view served leaders well when applied to static and simple processes. It begins to breakdown in its utility when applied to fluid-like and interdependent processes which have more in common with living organisms than with mechanical entities. Under more traditional roles associated with the

¹For an excellent discussion on this concept see Margaret Wheatley's book, <u>Leadership and the New Science</u> (25-45).

Newtonian world view, leaders felt the need to be highly visible and governed by being loved or feared. Surprisingly, ancient Chinese wisdom literature points to a more subtle role of leader which speaks of an alternative world view: the nearly invisible leader.

When the Master governs, the people are hardly aware that he exists.

Next best is a leader who is loved.

Next, one who is feared.

The worst is one who is despised.

If you don't trust the people,
you make them untrustworthy.

The Master doesn't talk, he acts.

When his work is done,
the people say, "Amazing:
we did it, all by ourselves!" (Tao Te Ching²)

With the advent of more interest in structured approaches to quality and with the introduction of models of learning organizations, people are asking whether a new perspective of leadership and associated skills are required of top executives. Traditional or Newtonian world views have portrayed leaders as a special group who set the direction of organizations, made the key decisions, and motivated people. Senge speaks of such leaders as being rooted in an individualistic and nonsystemic world view (Newtonian) which is based on assumptions of people's powerlessness, lack of personal vision, and inability to master the forces of change. A plethora of research on leadership³ suggests there is growing disappointment over the ability to prepare and equip people to assume effective leadership. Additionally, a number of trends are pushing organizations to look at alternative leadership models. Some of those trends include: greater emphasis of strategic plans and group-directiveness, less tolerance for poor decisions, greater accountability of limited resources, and the ever-increasing need for faster responsiveness to change and competition. All of these trends are attempts to exert greater control and predictability at a time when organizations are growing in complexity. The dilemma facing leaders is that as the complexity of the organization grows, the less likely any one leader can assimilate the key elements of information needed to make a sound decision. There seems to be an emerging consensus that decision making will necessarily have to be pushed further down in the organization where the key elements of information can reasonably be assimilated and acted upon. Further, executives will be less likely to "operate" the organization on a daily basis. It is little wonder then that there has been so much talk about what should be the role of a leader facing these challenges.4

Almost by default, roles which have been less valued for leaders in the past are emerging and gaining increased importance through sheer necessity of contending with organizational change. Peter Senge describes three lessor known roles of a leader: designer, steward, and teacher (340). Suggestive of the viewpoint of the ancient Chinese

²Author is Lao-tzu who lived probably around 551-479 B.C.E. but nothing else is known about him.

³See the authoritative reference work, Bass & Stogdill's <u>Handbook of Leadership</u>: Theory, Research, & Managerial Applications.

⁴We appreciate that role theory of leadership has been considerably enhanced by contingency theories, but still find valuable insights from the seminal 1957 work of Merton's <u>Social Theory and Social Structure</u>.

philosopher mentioned above, we see these roles as less visible to the naked eye. It is through observation that we offer to comment on these roles, for we truly believe they are emergent properties already showing themselves in our most successful leaders who are adapting to change. Along with our commentary we have identified three interdependent aspects of organizations which a leader impacts when assuming those roles: the system, teams, and individuals. To make the picture complete we have integrated our shortened version of a Robert Sternberg model of learning⁵ stressing three types of problem solving components: executive, performance, and knowledge acquisition. The complete look of

this suggested model for leaders in a learning organization is presented in Figure 1. For the remainder of this paper we will describe our view of how we believe the work of Sternberg and Senge, when combined, enhances our understanding of leadership. First, we will start with describing the leader in a system.

	System	Team	individual
Executive Components	Designer Staward Teacher	- Designer - Steward - Tescher	Designer Steward Teacher
erformance Components	Dosigner Steward Teacher	- Designer - Steward - Teacher	Designer Steward Teacher
(nowledge Acquisition Components	Designer Steward Teacher	Designer Steward Teacher	Designer Steward Teacher

Enhanced Roles For Leaders

The leader as controller of a system is coming under increasing scrutiny and criticism. As complexity increases in organizations the more difficult it is to understand and control it. Even in the age of downsizing it does not necessarily follow that the smaller organization is getting less complex. Technology and interrelationships with stakeholders and customers are enabling smaller organizations to offer ever more ways to respond to variety. As response variety increases interdependencies grow and the ability to predict outcomes of effort become increasingly uncertain. Leaders are often bombarded with hundreds of control mechanisms coming from all corners of the organization. Some respond to the overload of information by demanding simplistic control mechanisms. The paradox is that more information, not less, is required to reduce random variety of organizational responses. For every potential variety of a system response there needs to be a potential capability for change or permutation. This principle was first described by Ashby in 1963 as the Law of Requisite Variety. Beer, an early pioneer in cybernetics, had this to say about Ashby's law:

Often one hears the optimistic demand: "give me a simple control system; one that cannot go wrong." The trouble with such "simple" controls is that they have insufficient variety to cope with the variety in the environment. Thus, so far from not going wrong, they cannot go right. Only variety in the control mechanism can deal successfully with variety in the system being controlled. (44)

⁵Robert Sternberg's model is commonly referred to as his triarchic theory of intelligence. His theory is far more complex than our depiction of a portion of it in this paper.

Beer's statement suggests to us that if a leader intends to control an organization, there must be as many control mechanisms available to that leader as there are states in the organization or system. The need for more control mechanisms soon outpaces the capability of any single person to wisely understand and use them. This suggests that leaders of large and complex organizations ought to reevaluate their role as principle controller.

Leader As Designer. Senge addresses the issue of control for leaders by focusing on the concept of local-organic control (290-295). He argues that leaders should shift from overt concern of controlling to understanding the processes of control. His concept of local-organic control places emphasis on countless local decision making processes that continually respond to changes in the effort to maintain internal balances critical to stability and growth. Rather than leader as controller, he speaks of the leader as designer, steward, and teacher. On the role of leader as designer he says,

Imagine that your organization is an ocean liner, and that you are "the leader." What is your role? I have asked this question of groups of managers many times. The most common answer, not surprisingly, is "the captain." Others say, "The navigator, setting the direction." Still others say, "The helmsman, actually controlling the direction," or "the engineer down there stoking the fire, providing energy," or, "the social director, making sure everybody's enrolled, involved, and communicating." While these are legitimate leadership roles, there is another which, in many ways, eclipses them all in importance. Yet, rarely does anyone think of it. The neglected leadership role is the designer of the ship. No one has a more sweeping influence than the designer. What good does it do for the captain to say, "Turn starboard thirty degrees," when the designer has built a rudder that will turn only to port, or which takes six hours to turn to starboard? It's fruitless to be the leader in an organization that is poorly designed. Isn't it interesting that so few managers think of the ship's designer when they think of the leader's role? (341)

Subtle design changes are more likely to be improvements when made on the basis of strategic plans which are systemically sensitive. Perhaps no other person has been as effective in communicating the necessary knowledge required of a leader as a designer than W. Edwards Deming. His argument centers on the importance of leaders possessing understanding about four related areas: systems, variation, role of theory, and psychology. He called the use and integration of these four areas profound knowledge (96). Deming believed that understanding of profound knowledge will lead to transformation of organizations under the auspices of enlightened leadership. Such a leader understands systemic issues, values predictability, designs on the basis of theory, and appreciates learning as a source of innovation. Although Deming did not compare his theory of profound knowledge with Senge's view of leadership, we believe the connection is fairly apparent. In particular, we believe Senge extends Deming's profound knowledge model by addressing the role of leader of a system as one who integrates vision, values, purpose, systems thinking and mental models to propel organizations further along in learning.

<u>Leader As Steward</u>. The challenge facing most leaders when integrating, involves the role of stewardship. The word stewardship conjures up many images. Immediately, we thought of wise users of limited resources. Senge offers a completely different and

compelling image: the leader as steward of the story (345). We thought about examples of great story tellers in industry. In our minds one of the greatest was Walt Disney. Although Senge does not mention Walt Disney, we could not help but draw comparisons. Senge manages to capture the essence of Walt Disney's success by describing the "magic" quality of leadership. Much has been made regarding the value of visioning. Our experience with visioning suggested a rather uninspiring and mechanical process of creating a terse vision statement for strategic planning purposes. We were the proud possessors of a vision statement but after a few weeks we were hard pressed to recall what it was. Senge points to the reason: it is not enough to simply possess a vision, but the vision must be the result of a larger all-encompassing story which leads to the vision. Senge calls it the purpose story. Walt Disney may not have been able to articulate the definition of a purpose story but those closest to him routinely describe the impact his story telling had on the sense of purpose he gave to the Disney company. He made people feel and believe they were part of something much bigger than themselves. A friend of one of the authors, who worked for Walt Disney as a musician for thirty years, often spoke of how at the start of each work day, Walt Disney would pull his people together and literally act out the plots of his film projects and remind those present of the purpose of Disney: to bring happiness to people.

The authors who work at the Air Force Quality Institute decided to conduct a small experiment on the power of the purpose story when contrasted with a typical vision statement already in existence.

<u>The Existing Identity (or vision) Statement</u>: We're a world-class team, embracing quality and communicating Quality Air Force.

Most people we asked within the organization to repeat the statement could usually mention something about quality and telling people about it. Most did not seem inspired, however, with the statement when we read it back to them. Next, we constructed the following purpose story:

Our Story

Samantha Jones is making a career decision. Samantha Jones wants to join a world-class organization. One which is clearly out in the lead in presenting unique challenges to its members. Challenges which cross city, state, and country boundaries. Challenges which demand a personal commitment to continuous individual growth. An organization which is committed to enable her to meet those challenges. An organization which values enthusiasm, fresh perspectives, and old-fashioned hard work. A career counselor gives her a portfolio of the top twenty-five organizations in the world. From the portfolio she selects the United States Air Force.

She is excited but knows the competition is keen for jobs in the Air Force. She completes an application. Anxiously she awaits news. She is invited to a panel interview. The panel wants to know about her previous challenges and views about learning. Again, she waits for news. The phone call comes. She's been competitively selected. The Air Force has made a decision to commit to her future growth. She can barely contain her excitement.

Her excitement grew. When she looks back now on an Air Force career covering many years she is still awed over her experiences. The Air Force spared no expense in the early years to equip and enable her to perform her job using quality principles and tools. New to the organization, she was on the front-lines of serving Air Force customers. It amazed her that the Air Force focused so much of its resources on equipping her to do her job, even though she was so new. The commitment given by the Air Force was returned tenfold. As she grew and learned she became an enabler for new talent. No one had to ask. She volunteered. Quid pro quo.

We then summarized our intent with the following:

The power of a story, well told, shapes our vision, and our future. We only have to examine the effects of the Disney story to see the potential. We've a story to tell to the Air Force and the world. It is a story about commitment, investment in new talent, and a belief in the golden rule: Do to others what you would have them do to you. Regardless of how we serve out our roles in the Quality Center, what brings us together, and gives us a common purpose is our story. The story can be told by word of mouth. It can be told by the pen. And it is told by what we make.

The response we received from people after they read the story was overwhelmingly positive. It was easier to remember and clearly inspirational.

Leader As Teacher. Recently two of the authors had the opportunity to observe behind-the-scenes at the Florida Disney animation studios. We talked with the director of animation about how they were able to increase the number of Disney animated films being produced. Also, we were interested in how they managed creative talents on a focused task of completing a full-featured animated film. The director admitted that he was challenged by the time and money constraints for developing a film and focusing individualistic artists on the film script. He spoke of dynamic tension. The expression of artistic viewpoints coupled with the potential for change created tension when viewpoints were challenging the boundaries set by previously determined scripts, time and money constraints. Senge speaks of a similar tension which he labeled as creative (357). To sustain creative tension the leader presents a vision and concurrently tells the truth about reality relative to the vision. This is done is such a way that the gap between the vision and reality cannot be ignored. The awareness of the gap creates within the individual an intrinsic desire to close it using creative energies (357). The leader as teacher ought to accurately assess the likely response when the gap is highlighted and whether or not people have the capabilities to understand and act. Otherwise considerable harm to morale is likely when the leader presents a gap which individuals or teams cannot close. If the leader perceives such a scenario then it is reasonable to pursue whether enhanced training and education should be introduced in addition to current on-going efforts by individuals to learn and improve. This sense of timing and judgment falls on the shoulders of leaders. They, in effect, are managers of creative or dynamic tension. The skill sets required of leaders to perform this role involve the learning components we mentioned above, namely: knowledge acquisition, executive, and performance. These skills help the leader to accurately read the environment to portray reality, assess the best strategy for conveying both reality and purpose story, and enabling the purposeful action needed to close the gap. We now turn our attention to describing these three components as they relate to the leader in this role.

- Knowledge Acquisition Components. Effective leaders can read the environment around them with selectivity and accuracy. Since it is impossible to learn everything, the leader must be able to filter out the irrelevant and pick up on what is truly important information. Information so obtained must be retained in a meaningful form so that it can be used later.
- Executive Components. Before a leader responds to events they must make some decisions about the kind of issue or problem with which the organization faces and determine which strategies are best suited for the response. Once a strategy is selected and implemented the leader ought to be able to monitor its use and evaluate the continued suitability of the strategy.
- Performance Components. During execution of a strategy certain skills are required to regulate the accuracy and timeliness of action steps. Leaders can help individuals through the design of tools and work environments to facilitate their understanding of what is required to perform effectively. Such tools and work environment design can encourage individuals to take preventive action, anticipate accurately the amount of effort required for tasks, and develop the necessary self-regulatory skills.

Considerable research has been conducted on self-regulatory skills which depend on the above components. We believe self-regulatory research contains many important applications for use by not only leaders but can be very useful when applied to anyone's daily work operation. Cognitive psychologists⁶ refer to self-regulatory skills as metacognition. The prefix "meta" means to "look beyond or transcend." Cognition is a term referring to thinking and reflecting or processes related to those activities. By combining "meta" with "cognition" it translates into a person's ability to self-examine their own thinking processes, or to be aware that this self-reflection transcends routine thinking skills. We extended this rather interesting area of cognitive science to include concepts like system and daily operation metacognition. The definition we gave to system metacognition is the leader's or follower's understanding of their work as part of a larger system with systemic properties. The level of system metacognition varies across individuals. We defined daily operation metacognition as the knowledge or cognition that takes as its object or regulates any aspect of any cognitive endeavor on the job. By this we mean that the individual has knowledge of their own cognitive resources and their compatibility as learners with the job environment learning situation.

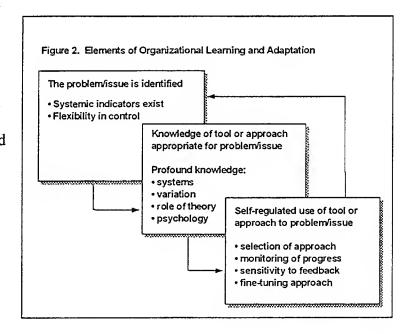
The ability to reflect on one's own cognitive processes, to be aware of one's own activities while working on continuous process improvement efforts has important implications for individual effectiveness as an active, planful learner on the job. If an individual is aware of what is needed to perform effectively, then necessary steps can be taken to meet the demands of a learning situation at work. If, however, an individual is not aware of his or her own skills sets as a learner or that of the complexity of the task at hand, then he or she can hardly be expected to take preventive actions to avoid problems or recover from them when they arise. Most people perform to some level with these skill sets, but we argue for assisting leaders and followers to take on characteristics of expert

⁶The reader is referred to the work of John H. Flavell, particularly his seminal article, "Metacognition and Cognitive Monitoring," American Psychologist 34 (1979): 906-911.

self-regulators. Experts rapidly check their problem solutions, they are more accurate at judging problem difficulty, apportioning their time, asking questions, assessing their knowledge and predicting the outcomes of their performance. We believe that self-regulatory skills are important for learning and can be significant predictors of problem-solving abilities that result in new learning. In our view, there are common skills⁷ associated with system and daily operation metacognition which both leader and follower exercise, albeit at different levels and roles:

- Ability to recognize the nature of processes and problems
- The selection of suitable approaches towards the problem
- The selection of strategies for combining approaches as needed
- Allocation of processing resources across work and system tasks
- Monitoring of improvement/solution progress
- Selection of relevant information from the total stream of incoming information
- Appropriate sensitivity to feedback from the process and execution of strategy
- · Ability to translate feedback into an action plan
- · Ability to implement an action plan

Both the leader and follower who possess well developed metacognitive skills, such as the ones listed above, are more likely to successfully use continuous improvement tools for continued learning about themselves, others, and the overall system. Figure 2 shows our organization of three key elements of organizational learning. Up to this point in time most organizations which have undertaken to learn about quality have placed considerable emphasis on learning about tools and



approaches for addressing problems and process improvements. Some, with the advent of strategic planning models, have undertaken the effort to learn about ways to identify problems and opportunities for process improvement under the rubric of system control. The third element, arguably the most important of the three, of self-regulation or metacognitive skills presents considerable challenges to most organizations. In most cases, efforts related to improving self-regulatory or metacognitive skills in workers are the least developed in organizations. Efforts may center on explicit training and education programs related to those skill sets. We see learning organizations setting up in-house learning centers whose sole function will be to address those metacognitive skills mentioned above. A place within the organization where people are continually learning

⁷We have taken Robert Sternberg's taxonomy of cognitive competencies and translated it to our view of work behaviors. For his actual taxonomy see his work, <u>Handbook of Human Intelligence</u> (997).

how to learn together. A long-term approach, and possibly the most creative, would focus on designing work operations which encourage, if not out right explicitly require, the use of enhanced metacognitive skills.

We see exciting possibilities when attempting to design the system to support metacognitive skills use by teams and individuals in daily operations. For us, the challenge lies in the design of processes and tools which have built-in expertise and appear to the user as nearly transparent as the use of the pencil is to most adult writers. Tool transparency might occur when job outcomes and the tools required for them become inherently linked together. Excess, extraordinary, or perceived superficiality of effort would not be required by the person when using quality tools which have been purposefully designed into the job by the leader. We envision a time when a need for deautomatized learning would not occur apart from daily operations, but instead, would occur through expert-contained products whose use would result in *learning by doing*. Such a design feature would help minimize costly and lengthy traditional classroom instruction and strengthen the association between daily operations and self-regulated learning on the job by teams and individuals.

Generally speaking, the use of quality tools seem cumbersome because we are asking people to think and learn in explicit or publicly structured ways which is generally done by individuals silently or implicitly with varying degrees of self-regulatory monitoring. In our research, we have found, for the most part, that people who do not routinely monitor or self-regulate their problem-solving strategies resist outside imposed regulatory structures or models (Hall, Gerber & Stricker). This is typically the case because the use of self-regulatory structures or models require people to pause and reflect, or de-automatize, the thinking or problem solving process. The de-automatization of what is perceived by an individual as a fairly fluid or automated response or stratagem to a problem can create frustration. The frustration is particularly acute if the individual perceives that they are being required to de-automatize their response which is understood by them to be fundamentally sound and estimated by them probabilistically to lead to success. Further frustration occurs when people attempt to vocalize to others, as when working as a team member, the logic they have used to decide on a automatic stratagem response. Research on the ability of people to articulate what they do when responding to a problem with a consistent relation-structure (e.g. experts who see such consistency) suggest that the explicit verbal report does not always map well to what was actually done in the performance of a complex task9. This may help explain why, in some cases, a team effort consisting of experts (which has not evolved through experience and training to the level of a high performance team) to solve a complex problem may produce less than satisfactory results than that which could have otherwise been obtained had a single expert approached the problem. The caveat in our minds is that there are greater risks, however,

⁸The authors have developed a number of these tools which exists in paper and computer software products. In particular, we have worked on personal mastery portfolios and team decision making software which stress the importance of metacognitive skills.

⁹We have provided our interpretation and generalized application of Dave Porter's research recognizing that his research on intermediate cognition is far more extensive than our depiction of it in this paper.

with relying on just one expert perspective¹⁰ when faced with complex problems or process improvement efforts. The solution to this dilemma might be found in preparing people to critically think in groups and practice sound metacognitive team skills. The end result would be what we refer to as a high performance team.

Summary

Referring again to Figure 1, we understand the varied roles of leaders to include the key ones of designer, steward and teacher. These particular roles are applied across the matrix in efforts to assist individuals, teams, and the larger system. We offer three questions to summarize the focused efforts taken by leaders of learning organizations:

- Executive Components: How can I help to facilitate decision makers?
- <u>Performance Components</u>: How can I help to facilitate getting tasks done with speed and accuracy?
- Knowledge Acquisition Components: How can I help to facilitate getting relevant information?

Each of these questions can be addressed for individuals, teams, and system executives by the leader as they operate as designer, steward, and teacher. We have attempted to paint a word picture which convincingly portrays the challenges and opportunities facing leaders of learning organizations and suggests the value of our integrated model. Although leaders of learning organizations, using our model, would become less visible in traditional roles, the legacy left by them would live on in their followers' successes.

<u>Note</u>: Views expressed in this paper are those of the authors and do not necessarily represent the views of any government agency.

Works Cited

- Bass, B. M. Bass and Stogdill's Handbook of Leadership. 3rd edition. New York: Free Press, 1990.
- Beer, S. Cybernetics and Management, Science Edition. New York: John Wiley & Sons, 1964.
- Deming, W. E. The New Economics. Cambridge: Massachusetts Institute of Technology, 1993.
- Hall, R. J., Gerber, M. M., & Stricker, A. G. <u>Cognitive Training</u>. In <u>Handbook of Cognitive Behavioral Approaches in the Schools</u>, Hughes and Hall (eds.). New York: Guilford Publications, Inc., 1988.
- Hughes, R. L.; Ginnett, R. C.; and Curphy, G. J. <u>Leadership Enhancing the Lessons of Experience</u>. Boston: Richard D. Irwin, 1993.
- Lao-tzu, Tao Te Ching, translated by Stephen Mitchell. New York: Harper & Row, 1988.
- Merton, R. K. Social Theory and Social Structure. New York: Free Press, 1957.
- Porter, D. B. <u>A Functional Examination of Intermediate Cognitive Processes</u>. Oxford University: unpublished doctoral thesis, 1986.
- Senge, P. M. The Fifth Discipline. New York: Doubleday/Currency, 1990.
- Sternberg, R. J. <u>Handbook of Human Intelligence</u>, Edited by R. J. Sternberg. Cambridge: Cambridge University Press, 1982.
- Wheatley, M. J. <u>Leadership and the New Science</u>. San Francisco: Berrett-Koehler Publishers, Inc., 1992.

¹⁰A recent publication on leadership by Hughes, Ginnett, & Curphy contains a profound statement, "Being able to analyze your experiences from multiple perspectives may be the greatest single contribution a formal course in leadership can give you." (18).

The Role of Leadership in Organizations



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The Role of Leadership in Organizations

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This paper defines a new role for the leaders of today's organizations. It examines organizational theory, organizations, the nature of organizations, and a leadership role for the senior leaders. The new role is to train themselves out of a job and this paper suggests how and why to do this.

In the rapidly changing environment of today, within which our organizations exist, the role of the leader has become increasingly more important. Even after spending four years at one of this nation's finest leadership laboratories and nine additional years of studying leadership, it would be presumptuous of me to say that I could sum up leadership's role in the organization in one sentence. But for the purposes of this final, I would like to propose this: "The role of the leader in today's organization is to train himself or herself out of a job." I know that this will go against the grain of the majority of the leaders. Many long hours, they would argue, are spent putting themselves in a position where they feel they are indispensable to the organization. My sentence says just the opposite. First, let's briefly look at organizational theory and change. Second, we'll examine what an organization is and nature of organizations. Since this paper is about leadership we'll look at typical reactions to leadership in two types of organizations. Finally, I will answer why you, as a leader, would want to do this and then how to go about doing this.

"The primary concerns of organization theory are understanding and explaining organizations: their structures, the variables that affect their behavior, their internal processes, and the ways they affect and are affected by the behavior of their members"(Heffron, 1989, p. ix). The role of leadership has a great influence across the entire spectrum of organization theory. Leaders play a key role in determining structure, behavior, and internal processes. "Change is inevitable for individuals, organizations and society"(Heffron, p. 152). Hopefully, this change will lead to the growth and development of the organization. Since this change is unavoidable, it becomes the task of leaders to manage this change. I will address this later as I explain my proposed role of leadership. First, we need to examine organizations.

"Organization is a comprehensive term encompassing entities as large and diverse as the Department of Defense and General Motors and as small and simple as the single-owner restaurant employing four people or the Police Department of Wallace, Idaho, which has only three employees" (Heffron, p.2,). All organizations share certain common features which include involving two or more people, working towards accomplishing a common set of goals, by a coordination of activities which requires some type of structure (Heffron, p.2).

Combining these factors into a definition, organizations become "a system of coordinated activities of a group of people working cooperatively toward a common goal under authority and leadership" (Scott and Mitchell, 1976, p.29).

The nature of these organizations can be viewed as existing on a continuum. An organization will fall somewhere on the continuum. This position will change from time to time and situation to situation. On one end of the continuum are the CLASSICAL perspectives. On the other end of it are the BEHAVIORAL perspectives. Everything else is a blend of the two and fall some where between them.

Organizational Model Continuum

Classic Model	Behavioral Model
Bureaucratic	Participatory
Authoritative	Democratic
Centralized	Decentralized
I	I
Rational	Irrational
Scientific	Humanistic
Structure	Behavior
Organization Focused	

Most of the organizations that we deal with on a day to day basis, from the moment we first awake until we go to sleep, are patterned after the closed, bureaucratic model. They tend to fall closer to the left end of this scale. It is in this type of organization we spend over one-third of our adult lives. It is the type of organization we face in all our dealings with the society around us. Historically, they have been primarily concerned with the development of itself as an entity and little else.

The Classical Model is based on a set of old assumptions that date back to the dawn of the Industrial Revolution. One of the assumptions is that people are lazy and must be forced to work. This causes a formal hierarchical structure to be put in place to insure that work is accomplished. This structure is formal and is characterized by many levels. These are required because every man has limited scope of responsibility (the ability to watch many employees at once). Power and knowledge are concentrated at the top of the organization. It is at the upper levels that autocratic decisions are made (centralized). Directions flow down the Scalar Chain of command. The lower levels have little input. The subjugation of the individual is required for the good of the organization. Discipline is used to force compliance with standard operating procedures. These scientifically developed procedures define the one best way to accomplish any task and in turn organizational objectives (Shafritz & Ott, 1992).

This model least takes into account the people who must operate within this type of structure. This formal structure and autocratic leadership style tend to produce certain types of behaviors and a defensive climate for employees to work. Air Mobility Command's Facilitator Guide matches types of leadership actions and the resulting behavioral responses:

Leadership Action	Employee Response
Ordering	Conforming
Punishing	Resenting
Regulating	Depending
I	I
Telling	Avoiding Initiative
Shaming	Hiding & Denying
Guilt-Producing	Apathy & Depression
Judging	Deception
	1 2 1

Robert Denhardt states that organizations have concentrated on growth and productivity at the cost of subjugating individual growth (1981, p. xiii). They have concentrated too little on this aspect of the effects of their actions. However, unhampered by almost two hundred years of progress, our organizations have continued to be likewise structured. How can we progress in a structure that tells us to check our identities and personalities at the door, go to work, and then expects us to be productive? The behavioral perspective is an attempt to correct this.

The Behavioral Model is focused on developing an organization based on putting people first. The perspective that people are lazy and must be forced to work is dismissed. People are now viewed as wanting to achieve and succeed and are willing to work to do this. This causes a flattening of the formal hierarchical structure. Fewer levels are needed to insure that work is accomplished. Power is shared. Knowledge is considered to be found throughout the organization (the experts are the ones who do the process daily). Decision making is a participatory process. Decisions are made at the lowest level possible (decentralized). Information flows throughout the organization. The lower levels have tremendous input. The individual is the strength of the organization. Rewards and recognition are used to reinforce creativity and inventiveness. Standard operating procedures can and are expected to be challenged for validity (Shafritz & Ott, 1992).

This model emphasizes the people who must operate within the organization. This less formal structure and participative leadership style also tends to produce certain types of behaviors. Again, the Air Mobility Command's Facilitator Guide matches types of leadership actions and the resulting behavioral responses:

Leadership Action	Employee Response
Listening	Experimenting
Understanding	Creating
Trusting	Risking
I	I
Sharing	Autonomy
Clarifying	Participation
Rewarding	Producing

"From this perspective it is assumed that organization creativity, flexibility, and prosperity flow naturally from employee growth and development. The essence of the

relationship between organization and people is redefined from dependence to codependence. People are considered to be as or more important than the organization itself" (Shafritz & Ott, 1992, p.143).

I suggested that organizations can fall anywhere on the continuum defined by the Classical Model and the Behavioral Model. Organizations can, will and should slide on this continuum for each situation it faces. Each situation will call for a different type of response. It requires great skill to determine when to use which leadership style, knowing the associated types of behavioral responses, to maximize organizational results.

Earlier, I stated "a leader's role in organization is to train himself out of a job". I am sure you can probably come up with a half dozen reasons why you would not want to do this. A few of the reasons probably include "I need this job and now I can be fired or replaced", "I would have to share my power" and "If I am indispensable, I will be secure in this company". Let me ask you this; How are you going to get promoted, if in your present position, you are indispensable? If no one else can do what you are doing, how can you move on to do anything else? I think, changing to this perspective provides enough reason and motivation for a leader to train herself out of a job.

What then, is new role of leadership in the organization and how can this be accomplished? Leadership is the key to maximizing the potential of the individuals idealized by the open, people-focused model that must operate within the structural confines of the closed, bureaucratic model.

The way to training yourself out of a job is to capitalize on the potential of the individual in accomplishing the common purpose. A slide to the right on the continuum can be accomplished through a change in the style of management. Moving toward a more open, people focused model, can help to create an atmosphere for individual growth. For example, decision making authority can be decentralized and pushed down to the lower levels of your organization. You can use a more participatory style of management that gathers inputs from the experts on the front lines of the processes and allows them to have a say in the matters that affect them. Let the workers have a voice in developing and defining the goals toward which they have to work. Give them the authority and teach them to responsibly handle tasks.

Ernest Stech and Sharon Ratliffe more specifically define the role of the leader. By their wording, they seem to refer to these roles in terms of small group dynamics in a specific problem solving situation. I feel they apply just as well in a pure managerial role. Managing is really leading an all encompassing, giant team which solves many problems at once instead of one team for one problem. As you read the six defined roles, substitute the word organization for the word group.

- 1. The coordinator role: Communicate to all members about meetings, schedules, tasks, procedures and similar matters; act as an information clearinghouse for all group members and as a contact person with other groups or outsiders.
- 2. The facilitator role: Set up procedures and a structure for group work; assist members in identifying problems, defining issues, summarizing progress, and working together. (This role involves minimal direct influence on the group task. It concentrates on establishing an

interpersonal network that helps members work together to solve problems.)

- 3. The observer role: Be alert to how the group is functioning and particularly to which functions are not being met; describe to members what is happening in terms of the group process; show the group areas in which change might facilitate their work.
- 4. The gap filler role: Fulfill those functions which are not being handled by anyone else, particularly the functions of summarizing, clarifying, synthesizing, or facilitating compromise.
- 5. The monitor role: Once a group has determined a procedure to follow or a solution to a problem, see to it that the group is reminded of responsibilities, functions, and assignments for implementation of the decision; provide copies of budgets, schedules, assignment sheets and agendas to members so they can complete their work on schedule.
- 6. The trainer role: Teach group members ways of approaching problems; provide the group with methods of learning from their own experiences; arrange for outside consultants to train the group (1976, pp. 220-221).

I intentionally saved the trainer role for last. Above all else, the leader should be training his people. Passing these skills on to others is training yourself out of a job. The leader must enable his subordinates by teaching them the tools needed to fulfil their new roles in helping to make organizational decisions. The Air Forces' book, The Quality Approach, states in it's open paragraph on leadership "[Leaders] must provide continued growth opportunities along with the tools and training needed to accomplish the mission" (1993, p. Leadership II-1). Training others to fill these leadership roles will foster individual growth and development of skills.

Doing this will cause your personnel to change and grow. This, in turn, will change your organization. The organization will develop and prosper because the employees will feel responsible for that growth. A trust will be built between you, as the leader, and the subordinates of you organization. As this trust grows with continued training and guidance from you, you can gradually transfer internal organizational functions to your subordinates. You, as the leader, now have the freedom to address issues in the external environment. And, you have just trained yourself out of a job.

It is unlikely that we will be able to drastically change the structure of the organization any time soon. Most public organizations have their structure dictated by law. Denhardt says our organizations have slid too far to toward the left end of the continuum (1981). We are literally trapped in this type of structured environment. However, we can no longer afford to subjugate the needs of workers to organizational needs. The growth of individuals has been too long ignored by our organizations. The authors of The Good Society say that the development of individuals is a responsibility of organizations. Developing this "good" has fallen to the shoulders of the organization's leadership.

"A fundamental change in thinking is needed that is as radical as the scope, scale, and pace of today's change. The Conventional Wisdom that worked in the past, as well as many traditional assumptions, beliefs, and habits, will be changed. In their place,

guidelines will be [needed] for an Unconventional Wisdom -UW- for these uncertain times" (Kriegel, 1991, p. xvii). "UW says: The only way to move into the future is to let go of the past . . . and the present (Kriegel, p.108). My sentence on training yourself out of a job is just that. It is a break from the past and present, and it is a role for leaders in the future.

Leadership is the key to maximizing the potential of the individuals idealized by the behavioral model that must operate within the structural confines of the classical model, in creating a good organization and a good society. As a closing, I would like to quote The Quality Approach again. "The challenge to our leaders is to invert the organizational pyramid and change the role of leader or manager to a more supportive and empowering one."

BIBLIOGRAPHY

- AIR FORCE QUALITY CENTER (1993). THE QUALITY APPROACH ... Your Guide to Quality in Today's Air Force. Maxwell AFB, Alabama: United States Air Force.
- AIR MOBILITY COMMAND (1992). AMCSP501-8, Quality Improvement Facilitator. Scott AFB, Illinois: U.S. Government Printing Office.
- DENHARDT, ROBERT B. (1981). In the Shadow of Organization. Lawrence, Kansas: University Press of Kansas.
- HEFFRON, FLORENCE (1989). Organization Theory & Public Organizations, The Political Connection. Englewood Cliffs, New Jersey: Prentice Hall.
- KRIEGEL, ROBERT J., & LOUIS PATLER (1991). If it ain't broke...BREAK IT! and Other Unconventional Wisdom for a Changing Business World. New York: Warner Books, Inc.
- SCOTT, WILLIAM G., & TERRENCE R. MITCHELL (1976). Organization Theory: A Structural and Behavioral Analysis. Homewood, Illinois: Richard D. Irwin.
- SHAFRITZ, JAY, & J. STEVEN OTT (1992). Classics of Organization Theory. Belmont, California: Wadsworth Publishing Company.
- STECH, ERNEST, & SHARON RATLIFFE (1976). Working in Groups. Lincolnwood, Illinois: National Textbook Company.

The Year of Training: Walking the Talk – Is this the Best We can Do on Our Journey to the Year 2000?



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The Year of Training: Walking the talk

Is this the Best We can Do on Our Journey to the Year 2000?

Dr. Julia I. Palladini 375th Civil Engineer Squadron Scott AFB IL 62225

This paper addresses some of the problems created by the year of training and their possible effects on education and training in the year 2000.

The Year of Training (YOT) policy changes message (appendix A) released on 21 Jun 93 created shock waves throughout the Education and Training community. One major cause was the element of complete surprise. Field and Major Command (MAJCOM) inputs were not solicited prior to the release of the message and the MAJCOMs were not given any advanced notice of the sweeping changes that were effective immediately upon receipt.

At Scott AFB, the NCOIC of Base Training called an emergency meeting with all assigned training managers. A representative from HQ AMC Training also attended. The training managers voiced their concerns and wanted to put together some recommendations for implementation. Those participating were told that the command's position was to wait for the implementation guidance from Air Force Military Personnel Center (AFMPC). That position did not change even though several of the unit managers strongly urged a proactive stance.

The theory and intent behind the YOT changes are not the issue. One of the year of training goals is to set high training standards and develop the structure, policies, and procedures to meet them. Mandatory technical schools for both 3 and 7 skill levels and increased time in training along with the career field education and training plans (CFETP) will help to meet the stated goal. Another big plus was the inclusion of promotion and reenlistment policy changes needed to implement the training requirements. As logical and beneficial as the changes appear to be, there are major problems with implementing some of the new policies.

The highlights from the Air Mobility Command (AMC) Education and Training Workshop (3) state that "the typical military mentality is to get the job done no matter what the obstacles." This mentality is not supposed to be present under the year of training, but there is at least one blatant example: implementation of the train the trainer and OJT task certifier courses. For instance, the Air Force Education and Training Program update (1994) states that when individuals complete these courses, and meet the other established requirements, they should be qualified to perform these duties. The same paragraph says that students must complete exercises and demonstrate trainer/task certifier abilities to graduate. That sounds reasonable, yet the Train the Trainer course does not contain a single performance objective (appendix B). The only requirements are for the students to complete true or false questions correctable to 100%. Several of the questions are poorly worded, one correct answer even contradicts the course material.

The only parts of the courses distributed to the field for the facilitators were plans of instruction part 1 and the training videos, which follow the student texts almost verbatim. These

courses are set up for the guided discussion method of teaching, yet no lead-off or follow-up questions were included.

During the first task certifier course taught at Scott AFB, the class participated in a phone conference call with Mr Aday from the Technical Training School at Sheppard AFB. He confirmed several things for us, but two stand out: First, there is a trainer course and a task certifier course, both talk about the role of the supervisor, but there is not a supervisor's course. The assumption was that by teaching the two developed courses all supervisors would attend one or the other. This is not always the case! Second, they know the courses need to be improved and are not what they should be. The school had identified this to CMSgt Byrd, the training representative at Air Staff in an attempt to delay the April 94 mandatory implementation. Chief Byrd said the matter was out of his control and there was nothing he could do to delay the course implementation dates. This raises another important question deserving of an answer. Who owns the process of developing and implementing these types of courses? The question is not who's doing the developing and implementing, but who owns the process and has the authority to postpone implementation.

These are some course critique comments from the first task certifier course. All students were attending the course prior to facilitating it for members of their squadrons. Most were training managers or additional duty training managers. The comments answer the question: What did you like LEAST about the course? 1). The lack of ISD utilization. It appears to me we shuffled several old FTD trainer/supervisor course objectives and dropped them into these courses. Lack of quality development; we have to live with the results of this course. If we don't fix it before delivery, we will demotivate/frustrate all trainers/certifiers. 2). The supervisor's responsibilities were not addressed. This needs to be focused on immediately. 3). Uncertainties and unanswerable questions regarding policy and procedures. 4). It didn't give clear guidance on discussion matters. Also, it didn't explain the role of the supervisor. 5). I have been a training manager for over 12 years and this course confused me! 6). How did this course and the trainer course ever pass validation - It's broken - A true reflection on how senior management understands training in today's Air Force. It's broken, this should make it worse!!!

These courses must be revised to be effective. If standardized instruction or at least somewhat uniform instruction is desired the course facilitators must be provided a complete set of lesson plans. Imagine what training would be like at the technical training centers if the only course control documents available to the instructors were the outlines of the blocks of instruction with training objectives. No two classes would get the same information. What would the standards of training imply if the students were only required to answer true/false questions correctable to 100%? What does that say about these two courses? How will courses like these impact the trainees of today who will be the supervisors and certifiers of the year 2000?

Training policy has undergone at least three major changes since 1985, the 1987 and 1990 revisions of Air Force Regulation (AFR) 50-23 - governing training, and the year of training policy. At this rate, we can predict at least one more major wave of change by the year 2000. The 1987 changes tightened control and were very directive in nature. By 1990 the guidance was very vague. The theme of the regulation appeared to be do what ever you want as long as it works for you. Now we are back again to time limits. The grapevine has even predicted the

return of mandatory formal staff assistance visits for training once the latest revision is actually published. This time it will be an Air Force Instruction (AFI). At this point it is interesting to note that the career field education and training plan (CFETP) for education and training managers lists AFI 36-2201 as the technical reference for 45 of the major tasks to be performed. That is the instruction replacing AFR 50-23, but as stated, it has not been published and distributed to the field. The CFETP is dated 31 Oct 93. We have been using the CFETP for six months and still don't have the technical reference available that governs more than half the plan.

Given the data previously mentioned about where we are today, what will education and training be like in the year 2000? There is not a cut and dry answer for this question. If the process owner mentioned earlier can be identified and tell us his or her vision for training in the year 2000, we could write a plan to meet the target. Without that critical senior leadership input, those of us in the field are floundering from one wave of change to another. I do believe there will be one more major policy change in training before the year 2000. I believe the next change will be driven by the quality movement and it will involve another loosening of the reigns. This will come about because of a cultural shift that embraces trust, teamwork and continuous improvement. The time limits for initial skill upgrade will remain, but squadron commanders will be given more latitude for retrainees' requirements. Someone will ask why there is not a formal school for award of the 5 skill level? Then depending on current thinking either 5 level certification courses will be developed or 7 level schools will cease to exist. These are only predictions, but one concept remains constant. That is the garbage in garbage out principle. If we continue to pump garbage into trainees today in the form of courses that look nice but are not value added (like the Train the Trainer and OJT Task Certifier Courses in their current form), we will get garbage out - unskilled and unmotivated trainers and certifiers. Unless the senior leadership deploys down a vision, goal, or objective for training in the year 2000 we will continue to struggle to keep up with the changes. We have to take the time to do the right things right the first time and that has not happened in the education and training arena yet. It is very difficult to think about training in the year 2000 while there are so many unresolved issues and problems today. It is what we do in the present that will shape the future. Is this the best we can do?

Works Cited

Air Mobility Command, <u>AMC Education and Training Workshop Highlights</u> - Scott Air Force Base, 1993, 3.

Headquarters Air Force Military Personnel Center, <u>Air Force Education and Training Program Update</u> - MPFL 94-05, Randolph Air Force Base, 1994 .9.

Appendix A

Year of training (YOT) policy changes

One of the year of training goals is to set high training standards and develop the structure, policies and procedures to meet them. This process will take time.

Earlier, we provided you an update on changes to enlisted professional military education. The purpose of this message is to announce policy changes to enlisted technical training, skill level upgrade programs, retraining and reenlistment eligibility and promotion eligibility to senior airman and technical sergeant.

3-Skill level (apprentice) upgrade. Current Policy: 96% of our airmen attend resident technical training; the other 4% upgrade on-the-job or as by-pass specialists. New Policy: Effective 30 Sep 94, all airmen will attend in-residence training to be awarded their 3-level. There will no longer be by-pass specialists or local OJT to the 3-level. Interim Policy: Current policy will remain in effect for those skills without resident technical training. As new courses activate, resident training will become mandatory for 3-level upgrade.

5-Skill level (journeyman) upgrade. Current Policy: After 3-level upgrade, airmen immediately enter 5-level training and upgrade after around 13 months OJT, with less than two years in the Air Force. For some there is no career development course (CDC). New Policy: Effective immediately, to qualify for 5-level, airmen must: (1) have 6 months on the job experience as a 3-level before entering upgrade training, (2) complete 12 additional months in 5-level OJT, (3) complete the appropriate career development course, if/when available and (4) sew-on senior airman.

7-Skill level, (craftsman) upgrade. Current Policy: Senior airmen (SSgt sel) may enter 7-level training and be upgraded within minimum time, using no CDCs or formal resident training. New Policy: to qualify for 7-level, airmen must: (1) be SSgt or higher, (2) Complete a minimum of 18 months in 7-level OJT, and (3) graduate from 7-level school. All 7-level schools are scheduled to be operational by 30 Sep 96. Interim Policy: Until 7-level schools are available, only SSgt or higher may enter 7-level training. They may be awarded a 7-level after completing 18 months OJT.

9-Skill level, (superintendent) upgrade. Current Policy: MSgts are awarded 9-level after completing the senior NCO academy (SNCOA) correspondence course. New Policy: To qualify for 9-level, airmen must: (1) graduate from in-residence SNCOA, active duty only, and (2) sew-on SMSgt. Interim Policy: Effective immediately, until all SMSgts have the opportunity to attend SNCOA, the 9-skill level will be awarded upon SMSgt sew-on.

OJT Trainer Qualifications. Current Policy: None. New Policy: OJT trainers will: (1) be appointed and certified, (2) attend formal OJT trainer training (3) if enlisted, be airman leadership school graduates, (4) posses a higher skill level (military) or experience level (civilian) than the trainee. Interim Policy: Effective immediately, OJT trainers must meet criteria (1), (3), and (4) above. Formal OJT trainer training begins April 94.

OJT certifier qualifications. Current Policy: None. New Policy: OJT certifiers will: (1) be appointed and certified, (2) attend formal OJT certifier training, (3) possess at least a 7-level (military) or equivalent experience (civilians), and (4) be an individual other than the trainer. Interim Policy: Effective immediately, OJT certifiers must meet criteria (1), (3), and (4) above. Formal OJT certifier training begins April 94.

First term retraining/reenlistment eligibility. Current Policy: First term airmen must be 5-levels to be eligible to retrain or reenlist. New Policy: Effective immediately, to apply for retraining or reenlistment, first term airmen must be: (1) progressing satisfactorily in training and (2) recommended by their commander.

Promotion to SrA and TSgt eligibility. Current Policy: A1Cs must be 5-levels to be eligible for BTZ to SrA; SSgts must be 7-levels to test for TSgt. New Policy: Effective immediately, A1Cs must be 3-levels to be eligible for BTZ to SrA; SSgts must be 5-levels to test for TSgt (must be a 7-level to sew-on TSgt - same as current policy.

We are continuing to work these and related training issues on a schedule that allows us to bring each change on-line at the appropriate time. AFMPC will issue detailed implementing instructions for the above policies. This message should provide you a basic understanding of the key changes.

Appendix B

Train the Trainer Course Objectives

From POI Number J6AJS352X1 001

Trainer Responsibilities:

Identify the responsibilities and characteristics of a person designed as a trainer.

Learning Process:

Identify statements that pertain to the learning process.

Identify statements that pertain to the developmental approach to learning.

Identify statements that pertain to the laws of learning.

Identify statements that pertain to the training fundamental.

Interpret Training Requirements:

Identify the procedures used to identify training requirements.

Plan Training:

Identify statements that pertain to interpreting objectives.

Identify statements that pertain to methods of training.

Identify the procedures used to develop a task breakdown.

Today, 2000, and Beyond: The Quality Office From A Technology Point of View



Capt Kenneth S.S. Montgomery



Capt Brandon Jaeger

Captain Kenneth S.S. Montgomery received his BA in communications from Temple University, and a dual MA degree in Management and Human Resource Development from Webster University. He entered the military as a Missile Combat Crew member and is now the Chief of Presentation Systems and Assistant LAN Manager at ACSC. Prior to his military experience, he was heavily involved in the design, manufacturing, and installation of aircrew training systems and their associated training programs.

Captain Brandon Jaeger was born in Wilmington, Delaware and attended the University of Delaware where he obtained a BS in Economics. He went on to acquire an MBA at the University of South Dakota while serving as a Missile Combat Crew member/Instructor. Lt Jaeger is currently the Chief of LAN Administration and the head computer and LAN technician.

Today, 2000, and Beyond: The Quality Office From A Technology Point of View

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ABSTRACT

Information equals Power. Remaining globally competitive demands the capability to access and disseminate information quickly, easily, and effectively. This necessitates an office equipped with the latest technologies. Current trends indicate those with the greatest ability to harness the increasing flow of information will lead others into the 21st century. The Local Area Network (LAN) at Maxwell AFB's Air Command and Staff College (ACSC) can serve as a model for organizations seeking to create a "paperless" environment.

DISCLAIMER

The conclusions and opinions expressed in this document are those of the authors cultivated in the freedom of expression, academic environment of Air University. They do not reflect the official position of the U.S. Government, Department of Defense, the United states Air Force, or the Air University.

INTRODUCTION

It's happening now--the '90s have seen computers become almost as common an office fixture as desks and chairs. Computers promised to bring us to a higher level of education, increase our productivity, and positively impact our bottom line. However, this promise proved, in many cases, hollow. Computers were thrust upon users without proper training and proved too complicated. Remaining untouched and becoming quickly outdated, productivity seemed to stagnate or even decrease.

In part, this failure is attributable to a misconception of the relationship and importance of technology to people in the office environment. Paradoxically, people are as productive as the technology they are provided, however, the technology is only as good as the competence (including experience) of the people using it.

This paper discusses the "paperless" office concept--an area of heavy technological intrusion. The ACSC LAN example is offered as a viable starting point to reach this ideal. We discuss problem areas and present ideas for the year 2000 and beyond, focusing on technology as a total quality management (TQM) tool at ACSC. We leave it to our readers to induce this concept's implementation into their own operations.

THE "PAPERLESS" OFFICE

A PC-based "paperless" office appears in Figure 1. The PC's ability to interact (network) is the key to a "paperless" office. Typically, a network is the pathway used to transfer or store information passed between computers. More simplistic setups may be Apple-TalkTM or MS-DOSTM Interlink where computers connect not just to a printer but to each other as well. In our example, the amount of software resident at each computer should be inversely proportional to the amount of paper used. For instance, memos, telephone call messages, Post-it[®] notes, etc., are sent through electronic-mail (E-mail) messages from one computer to another. In fact, dependent upon the software purchased, any file created on one computer can be "attached" (paper clipped, if you will) to an E-mail message. Articles to review, presentations, purchase orders, letters, and meeting notes are but a few examples of items that are transferable over the network. However, network configuration and management will be key in the "user friendliness" of such a system. "Junk" E-MAIL can become as prevalent as that delivered by the U. S. Postal Service.

This is why a bulletin board system (BBS) is good for the "paperless" office. In the military we have bulletin boards for everything--security information, safety guidance, command policies, permanent items; you name it, there is a place to hang it. An electronic bulletin board system is similar, but more powerful. Files, programs, or simple notes can be attached to a bulletin board and given deadlines to "automatically clean" certain files after a specified date. Such a system is good for passing meeting notes, extra curricular activities, and the like. This frees memory on your network and centrally locates information for easy user access. Users can create and manage their own boards without disrupting the network. It also reduces the amount of paper and allows users to scan only those areas that are of use to them.

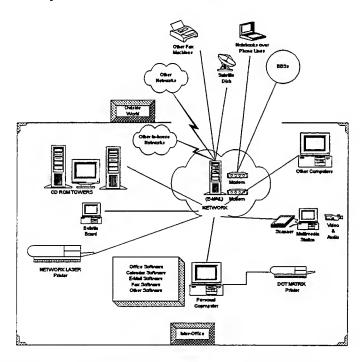


FIGURE 1: PC-BASED "PAPERLESS" OFFICE MODEL

Faxes are another costly paper arena. With the proper software and hardware, the "paperless" office allows faxes to be created, sent, and received on the computer itself. This gets rid of that unwieldy curly paper but, more importantly, the information can be disseminated more quickly and to a greater number of people. Configured properly, your network can use existing phone lines attached to a portable computer to send faxes directly to your personnel in the field. Access to E-mail, bulletin boards, etc., from remote locations can also be controlled by your network software.

What about scheduling? While some E-mail programs will show when and if E-mail messages were received, they do not ensure that people update their schedules. This is where calendar software is handy. Many calendar programs allow you to schedule others for meetings, check conflicts, allow overriding, track receipt or acceptance of the scheduled meetings, update other computers, and set alarms for designated meeting times. These few examples illustrate the maintenance of an entire organization's schedule without paper.

What about presentations? These can be costly to produce and it's often difficult to find equipment. Presentation software allows you to travel with a notebook computer and overhead LCD display. All you'll require is an overhead projector, spare bulb, and clean white surface upon which to display. Instead of leaving black and white copies of your slides, you can leave a disk (or maybe CD-ROM) with color, video, and sound--all easier and cheaper for your prospective clients to copy and distribute as well.

However, what is the primary advantage of the "paperless" office? Information access. Books, data bases, libraries and information services abound, all available over a network. Within the office, CD-ROM towers on network servers provide access while eliminating the necessity of CD ROM drives on every computer.

"Paperless" Office Criteria ACSC's Common Software Usage

E-mail Beyond Mail
Calendar ON-Time*
Word Processing MS Word*

Database management MS Access[®]/MS database (limited usage)

Spreadsheet MS Excel*

Graphics Paint Brush/Corel Draw (limited usage)
Presentation MS Power Point Asymetize Compel

Internal Bulletin Boards Trellis Tackboard®
Fax BisCom fax Server

Network Banyan[®] Vines (Ethernet Card)

CDs (CD towers on network) PlexTor (Adaptek SCSI cards)
Specialized Software Toolbook", Photoshop", Microteck, MS Video for Windows",

Etc.

TABLE 1. ACSC SOFTWARE AS RELATED TO "PAPERLESS" OFFICE CRITERIA

Your network can connect to other networks via comm links or satellite feeds. Network modems (not at the computer) can connect with bulletin board systems for downloading software upgrades, freeware, or shareware. You can book your own air flights, shop, and even research the

latest information on an operation your doctor wants to perform. The amount of information available is virtually limitless.

Is such an office impossible to obtain? At ACSC, we have the basics of a "paperless" office in place. Table 1 lists the software currently in use.

NOT A REALITY, YET

The above is but a fraction of what is possible without a single piece of paper. Is this reality for the majority of organizations? No, in part due to the inexperience of most computer users. Paper and pencil are familiar and easy. That's how most of the staff and students went through school and operated in their previous environments. Often times computers are thrust on users with little to no help. They seem "user hostile" and frustrating--especially among those who don't type.

In addition, our current scheme of doing business is not computer centered. We like paper copies for legal reasons, e.g., signatures for equipment issue. Many individuals not accustom to proofreading on computers prefer paper to a computer screen. Our lack of experience also shows when hardware "throws us a curve." Regarding computers and disks, it's not a matter of if, but when, they'll fail.

Paper copies seem to last forever, and can always be retrieved, photocopied, or rewritten. While it is easy for most to place a letter in a file folder or store a photocopy, it's difficult to transfer this ritual to a computer file, file folder, and disks. Thus, when the hard disk crashes, all data is typically lost forever, especially if our undelete or disk doctor software did not work. Users sometimes forget to save original files, let alone backup copies. Thus, while the benefit of storing more data in less space is a significant plus (as is the minimization of physical trash), implementation doesn't always equal success. Until our paradigm shifts from a paper to an electronic environment, the "paperless" office is not an immediate reality. Management must play a major role in the success or failure of such systems. Most managers, however, believe that if they simply train their people, the problem is solved. Not so.

THE DICHOTOMY OF TRAINING

Technology changes daily. To stay abreast of the latest hardware, software, and techniques requires time, money and energy. Given the money-dominated paradigms of most corporations, money is usually the only investment leaders employ. Users, those who leaders "spend money on," rarely get to invest "quality, up-front" time and energy into the technology purchased. This leads to the dichotomy of training. On one hand, training is an important solution. The quality of this training is also a factor. Training solutions that consist of "read the manual" will fail. Why? Honestly? It's because most are lazy, unmotivated or find the manuals difficult to understand (having been written by programmers or engineers, not people who "use" it). These factors lead toward a resistance of change. Training companies (whose sole job is training software users) eagerly present thorough training programs as the solution to this lack of productivity. Then, of course, are the "how-to books for dummies" that have flooded the market.

The training received and time afforded users to "play" with software (learning <u>how</u> to use the program <u>their</u> way) will determine how often the "on the other hand" occurs. The "on the other hand" is the fact that training alone is not the answer. Take the following example--A

corporation decides to automate its staff, giving each a word processor, mail program, and network access. All employees are classroom trained on the software. Spelling errors and mistakes actually increased, even though secretaries now had additional time. Why? Lack of training or attention to detail? Additional training for the secretaries solved nothing. Why? The system itself was the problem. Executives neglected to talk to their secretaries. They sent letters to each other directly (without using the spell checker), bypassing the secretaries, then printing and sending the material out. The secretaries, not having material passed through them, never saw the items in question. Training, in this example, would not have solved this problem.

Consider another facet of this problem. Most conducting computer training make a dangerous assumption--that you know how to use your computer! At ACSC we discovered many don't know how to use a computer. For instance, turning the computer on, plugging it in, using a mouse properly, switching from a mouse to a track ball, the difference between SAVE and SAVE AS, not using disks with bad trap doors, unlocking disks, not deleting basic configuration files, not using illegal programs such as screen savers, the difference between Windows and DOS based programs, how to create icons, what functions keys are, what a menu bar is, what quick keys are, all these simple things are not necessarily readily known. Thus, training doesn't begin with the software, it begins with the computer. It may even begin with typing!

Training on menus, file management, optimizing, short cuts, configuring organizing, operating systems, icons, desktops, mouse and cursor, power switches, buttons, keys, saving, backups, finding, opening, changing, hard disks and floppy disks, etc., should be given before training individual software commands and tools. While our first attempt to go "paperless" with our schedule is going well, resistance is strong and a few students and faculty refuse to use the E-mail system. As time progresses, and the number of computer-proficient personnel increases, the "paperless" environment will become a reality.

TODAY

ACSC exceeds most Air Force units regarding PC employment. What's more, our technology leap was supersonic--occurring over one summer's time span. Upon arrival, each of the 580+ students is issued a 486/33 MHz laptop preloaded with the software required for instruction and access to the Local Area Network (LAN). See Figure 2. Microsoft® (MS) Office software (Word, Power Point, & Excel) provides the backbone for student papers, spread sheets, some testing, and presentation authoring/display. Each student, in addition to an internal hard drive, is given access to two network (one partitioned) drives labeled O or E: (for odd or even numbered seminar group file sharing) and M: (for E-mail files--students can send and receive mail worldwide). File sharing is accomplished using Windows drag and drop principles or through a DOS based bulletin board system. This bulletin board also contains tips and techniques on a variety of computer related issues, upcoming events, immediate job openings, and a multitude of other subject areas. Students can also access the Daedelus bulletin board service (BBS)--a program containing job openings/descriptions--for job opportunities.

Additional help is provided in an on-line help manual whose icon is located in the Help directory. MS WindowsTM also provides a help menu with excellent information on various topics. Each software manufacturer's tutorials and help files are also available for on-line reference. ACSC provides a copy of the software instruction manuals in each seminar room. Software and hardware training classes are held throughout the academic year. Independent of

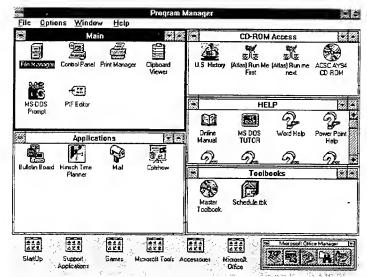


FIGURE 2. TYPICAL STUDENT LAPTOP WINDOWS DESKTOP

the curriculum, topics in these classes include: programming, introduction to specific software packages, and self-paced typing programs. ACSC provides a specialized staff of 11 people to assist in routine and emergency situations.

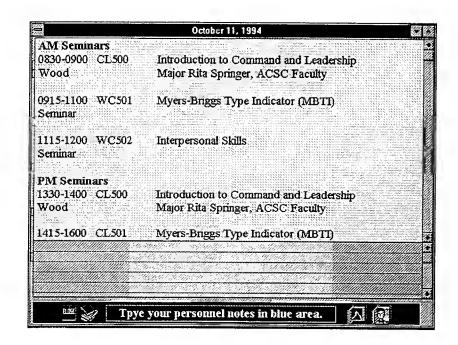


FIGURE 3. Sample Daily Schedule

At first, students were given paper schedules which were hand corrected when changes were sent through E-mail. Today, Toolbook® programs containing schedules, course descriptions, directories, and courseware are, in most cases, automatically updated when the students log on to the network. Students can print on personal printers, dot matrix printers in each seminar room, or networked laser printers. Most classroom assignments, research projects,

and exams are submitted on disk or to the advisor's E-mail box. The intent is to combine all research projects and curriculum programs onto a CD-ROM disk which students can take after graduation for others to access or acquire from ACSC. ACSC has a CD-ROM tower service on the network providing multiple CD-ROM access to computers not possessing a CD-ROM drive.

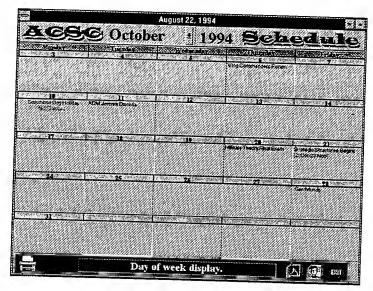


Figure 4. Sample Monthly Schedule

Faculty members may not necessarily use the same software as students. The major factor in this disparity is licensing agreements. Budget constraints limit authoring software to a few student and staff computers. Upgrades are also slow due to the number of student and faculty computers and conflicting schedules. Each faculty member has a 386 or better PC (soon to be all 486 PCs) on their desk and at a minimum a dot matrix printer and laser printer on the LAN.

Network laser printer services are strategically placed throughout the building, reducing printing costs (toner cartridges, maintenance, etc.). Modem capability to other networks and BBSs is also available over the network. Remote LAN access to E-MAIL boxes is possible over six separate 9600 baud modems. ACSC also has the capability to create master CD-ROM disks and conduct multiple disk copying.

THE ACSC LAN

The ACSC LAN, pictured in Figure 5, is a model configuration for taking advantage of the information available today. Our primary clients are students and faculty. Students are organized, on average, in groups of 13 per seminar with ACSC having a total of 44 seminar rooms. Each student is issued a 486/33 color notebook computer with 8MB of RAM and a 200MB hard drive containing all required software and a network interface card (NIC). The NIC permits access to the ACSC LAN. Connection is via a RJ-45 jack (the same kind of jack used on a telephone cable) through one of four multi-outlets, each with six connections—making each seminar capable of twenty-four network connections. The multi-outlets connect to a Multi-Media Access Center (specifically an MMAC 3) in the center of the room. The MMAC 3 is a network hub that sends the NIC signals through UTP (unshielded twisted pair) cables to an even

larger hub called an MMAC 8 that contains up to 8 additional communication cards. UTP provides the majority of LAN wiring at ACSC. It was selected for its ease of use and high data capacity. UTP currently accepts data transfer rates up to 10 Megabits per second, and, with the advent of new technology, the same wire will soon allow 100 Megabits per second of data flow.

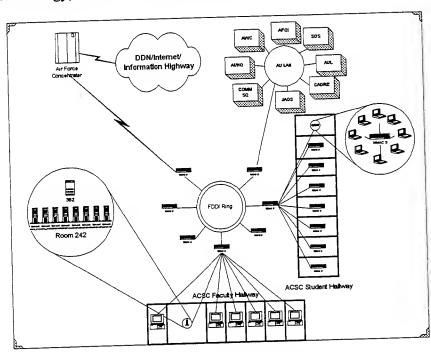


FIGURE 5: ACSC LAN CONFIGURATION

Once the signal reaches the MMAC 8, the hub itself determines where that signal needs to go. The hub sends the signal to one of the 6 other MMAC 8s in the building. The MMAC 8s are connected by an FDDI (Fiber Distributed Data Interface). The FDDI is a fiber optics product that transmits data at 100 Megabits per second. Finally the signal sent by the notebook will make it to one of the 8 Network servers. These servers are also connected to the LAN via UTP. The load is distributed as shown in Table 2.

The heart of the LAN, our network servers, are 486/66 machines with 32MB of RAM and 1 Gigabyte of storage space, running Banyan® Vines NOS (Network Operating System) for both its flexibility and ease of use. These servers process all communication signals and provide access to the dozens of services available on the LAN. Once connected to the LAN, clients have a multitude of available options. They can share files with their seminar mates or send E-mail with an attached document to their faculty research advisor. Each seminar also has a 386 computer and dot matrix printer. Instructors can load information, via seminar computer, onto the LAN and students can download it to their notebooks. Students can also conduct simulations with their seminar mates over the LAN.

Other services provided by the LAN include the ACSC bulletin board, fax server, CD-ROM towers, dial out, dial in, and shared Lasers. The bulletin board allows students to view daily information and create bulletins of their own, as well as share files with the rest of the school. The fax server allows faculty members to send and receive faxes over the E-mail system. The CD-ROM towers provide vast amounts of information, such as Air Force Publications and

encyclopedias to network users. Students and faculty can dial-in from home using their notebook's internal 14,400 baud modems. They can also dial out to any BBS from their computers using modems attached to the servers.

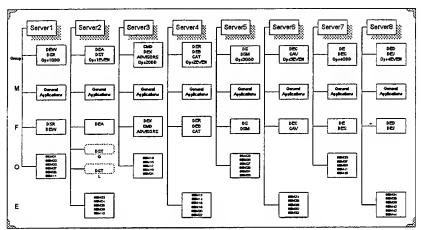


TABLE 2. ACSC NETWORK SERVER DISTRIBUTION

2000 A.D.

Our hope is through exposure to an automated environment, future AF leaders will be motivated to use computer technology to its fullest potential. If ACSC is successful in this goal, graduates will strive to implement many of our services in their new organizations by the year 2000. Six years may seem like a short time, but ACSC went from slow and outdated Z100 computers to its current configuration in under two years. Funding is the primary constraint, but determination and desire can definitely alter budget priorities. We hope our current configuration will serve as a starting point the rest of the Air Force will try to surpass.

Information equals Power. If this was false, there would exist no need for espionage, deception, intelligence, etc. By nature, information is global, changes constantly, grows every second, and must be accessible. Those with the speed, access, distribution and greatest quantity and variety will stay ahead. (Assuming they use their new found power successfully and continue TQM analysis of both people and equipment.) Incorrect, incomplete, or untimely information can be costly. Coupled with the old, but relevant cliché: "the more you know, the more you know you don't know" the need for an "ACSC-like" environment "hits home."

THE FUTURE

Technology is rapidly changing. The axiom "the day you buy your computer is the day it is out of date" is a serious reality. Predicting future trends is difficult. Years ago they believed the "home of the future" would be all automated-but they forgot the computer. (Back then a computer was vacuum tubes and wires.) We face similar dilemmas today. As software continues to consume more memory and accommodate more features, it appears that floppy disks will be an obsolete form of distributing software. Even now the mood of many software manufacturers is toward a complete CD-ROM based distribution system. This, coupled with an expansion of multi-media home systems, suggests the typical desktop PC is changing. Will it be simply CD-ROMs and removable hard drives? Will personal PC CD-ROMs be erasable? Regardless, users

should plan for CD-ROM and video/audio boards to become "assumed hardware standards" on the next generation of computers.

Then comes the operating system (OS). DOS and MAC have been at odds for years. DOS/Windows® applications were good at data manipulation and number crunching. MAC systems were user friendly and contain powerful audio, video, and desktop publishing environments. Now Apple is licensing its OS and has introduced its Power PC™ that can run IBM and MAC software on the same computer. Will this become the standard? Perhaps. To take advantage of the power of both systems will require such a computer, but there are also other systems (Silicon Graphics, etc.) that may be incorporated. For now, the Power PC™ should be explored, allowing time for any "compatibility bugs" to be worked out. Keep in mind, however, the training and "play" time that will be necessary for a dual-operating system.

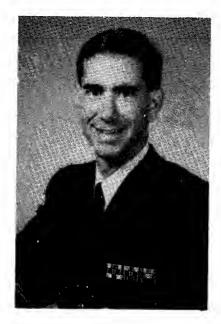
Perhaps the most immediate change on the horizon is teleconferencing. Cameras and speakers may soon become permanent fixtures on your monitor. There exist cameras small enough for even notebook use. Video capability permits you to view the recipient of your message, hold international meetings at your desk, or show a technician in another state the problem you're having on your computer. This type of interaction is more in line with current thinking of the "information superhighway" than multiple cable channels. People like to talk to people. They also like the comforts of their "home," even if that is their "office."

This brings us back to our equation: Information equals Power. The organization that has access to, uses, and distributes information effectively will dominates all others. This, at a minimum, will require access by way of modem to BBSs, database houses, and other networks. For the future, however, LANs (local area networks) appear to be "standard modes of operation." The benefits for medicine, education, deployment of forces, and daily operations are limitless. The future, some might argue, always brings us back to the past. Here such a cliché is true. In the future you will be limited by the amount of information you make available to yourself. How you manage (or mis-manage) information will impact your organization's progress, competitiveness and perhaps ultimately, your very existence.

PART III

Quality Perspective of the Environmental Factor in the Year 2000

ACC Environmental Quality Journey



Capt Tom Welch

Capt Tom Welch is currently the Quality Advisor to the HQ ACC Civil Engineer and formerly the Chief of the Pollution Prevention Branch. He was responsible for developing, implementing, and managing efforts to reduce the command's dependency on hazardous chemicals. He earned a Bachelor of Science in Civil and Environmental Engineering from the University of New Hampshire and a Master of Science in Systems Management from the University of Southern California. Tom is a registered Professional Engineer and a Registered Environmental Manager.

ACC ENVIRONMENTAL QUALITY JOURNEY

Capt Tom Welch HQ AIR COMBAT COMMAND, Civil Engineering

ABSTRACT: The new world order has thrust the U.S. Air Force into a dynamic period of change unparalleled in any period since World War II. While faced with the tremendous task of

operating the and respected history, we are global

"... professionals building and sustaining worldclass airbases and their natural environment..." Excerpts from ACC/CE mission statement most advanced military forces in also faced with a challenge of

environmental stewardship and restoration. These seemingly paradoxical challenges however are being met with extraordinary success. The same professionals charged with being the defenders of democracy are also equally protective stewards of the environment. All members of Air Combat Command are stakeholders in the environment in which we live and work. Environmental programs are best categorized by the major areas of Prevention, Compliance, and Restoration. We have achieved our successes in these areas through the cross-functional teamwork that pervades the Command's environmental efforts. Our senior leadership has been the backbone of our successes. The Environmental Leadership Board holds us accountable for our environmental actions and the Environmental Leadership Council focuses the environmental programs with corporate direction and emphasis. No one can deny the relevance of environmental issues in the U.S. military today and that Air Combat Command is emerging as a world class environmental leader. With sound leadership and teamwork, our environmental programs will posture the Command with cleaner, environmentally compliant bases for this decade and beyond.

FOUNDATIONS: During the past year, ACC has solidified the foundations that ensure the success of our environmental programs. The foundation is built upon: Quality Leadership, Team

Work and Leadership is creating a working others to achieve levels of Teamwork is "A of dedicated personnel from THE BUILDING BLOCKS OF OUR ENVIRONMENTAL PROGRAMS ...

RESERRES

Resources. Quality defined as the art of climate that inspires extraordinary goals and performance. cross functional team professionals with Civil Engineering,

Legal, Logistics, Operations, Plans, Hospital, Public Affairs, and Safety. Central to this concept is that every member of the team, regardless of rank, is equally valuable to the organizations." Putting emphasis on obtaining resources forced us to identify our needs and articulate and advocate for an adequate resource base such that we have the people, equipment, and training needed to get the job done. Quality Leadership means empowering people at every level throughout the command to take control over the processes they use in an effort to continuously improve them. We sought to improve our own command environmental program by starting at the top. The Air Combat Command Environmental Protection Committee and Environmental

Management Board changed its names and format to provide more active forums that ensure senior level involvement in decisions to support and enhance environmental programs. Principal members of the Environmental Leadership Council (ELC) and the Environmental Leadership Board (ELB) serve not only as their functional spokespersons but also as corporate members of an empowering body of decision makers. A significant spin-off from the reorganization was the establishment of cross-functional teams (CFTs). One such team is the Education, Training and Career Development CFT. Important issues being addressed by this group include determining the need for an environmental career field for NCOs, guidance on providing and documenting environmental training, and identifying and meeting environmental training requirements. As the leadership of this group moves toward the personnel community, the importance of collaborative staff efforts will become even more apparent as these initiatives are applied to the field.



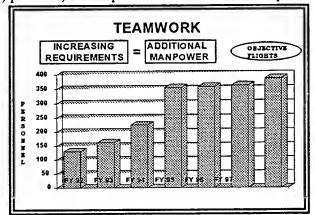
Teamwork- KRA Focus: One of our Key Results areas is "Training and Team Building." This includes building the professionals required to meet the ever changing environmental business.

Manpower: Our most important resources are our personnel.

Although the Air Force continues to downsize its forces, we've found the environmental challenges continue to grow. Responding to this ever

increasing legal requirements, we engaged in the first formally approved Air Force Wide environmental manpower study with other MAJCOMS and developed the Air Force Manpower Standards for Environmental Flights. This laid the groundwork to expand manning at the point of execution; The Objective Environmental Flight. The new flight structure identifies the required functions, position, and expertise for successful completion of the installation's

environmental ACC is
Flights by over two years.
staff is not the staff works with the Civil programming, housing and ensure well products. is also a cross-



programs. The results that robusting our Environmental 200 professionals in the next However, the environmental environmental team. Our the other functional areas of Engineering, such as engineering, readiness, financial management to coordinated and quality ACC's environmental team functional team with

personnel from many other directorates, such as: legal (JAV); logistics (LGS, LGM, LGT, LGW); operations (DOS); plans (XPP); hospital (SGP, SGB); public affairs (PAC); and safety (SEG). These team members are involved on a day to day basis in environmental issues and provide invaluable services, experience, and perspectives that contribute to our environmental programs' success.

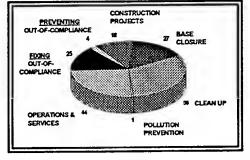
Training: ACC initiated an annual Environmental Quality Symposium which has provided extensive cross-functional training to over 1100 of our CE, Logistics, Public Affairs, and Medical customers throughout the Command. We've provided 40 different courses, conducted 230 classes in five days and issued a proceeding's book that captured the presentations from each of the courses. The 1993 book had over 450 pages while the 1994 book exceeded 750 pages. In addition, with the assistance of the Combat Camera Team, the staff produces two ECAMP training videos that describe requirements and processes necessary for completing successful ECAMPS. We are developing a 14 subject, 35 MM training package to help our bases train their new personnel and our newsletter entitled "OUTREACH" reaches over 750 customers monthly.

Professional Development. As a key aspect of empowerment, we actively encourage professional registration and career development. In June 1993, 16 members of the ACC environmental staff became Registered Environmental Managers through the National Registry of Environmental Professionals (NREP). The result is enhanced and empowered professionals representing the Air Force with the state and federal regulatory agencies and winning a voice in the course of national environmental affairs.

RESOURCES

Despite our successes in waste reduction and maintaining compliance, the number of

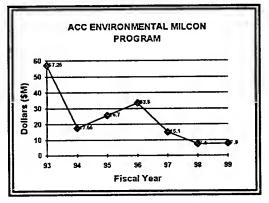
environmental
Fortunately the
resources we need to
grown as well, from
million last fiscal
continues to look
of growth than
ACC's successful
in a climate of



requirements continues to grow. operations and maintenance execute those requirements have \$48.4 million in FY90 to \$80.7 year. The investment trend positive though at a slower pace previous years. The key to advocacy for increased resources declining budgets has been our

ability to employ teamwork in our articulation and defense of line item requirements. Fact Based Funding Decisions: ACC's ECP continues to set the standard for program validation and execution. The Level One Reporting System (LORS) was created to focus attention on the lead time associated with designing and contracting projects to fix out-of-compliance requirements. Of the \$14.4 million in level one requirements identified initially in

LORS, ACC bases at least 50% designed well positioned to September 1993. To compliance, we must for infrastructure process must requirements as well technological and 93 - 99 environmental developed with this in



had over 95% of the projects as of 1 June 1993 and were award all projects by 15 achieve and maintain proactively plan and program investments. This planning incorporate existing as account for future regulatory changes. Our FY MILCON program was mind. We have developed

streamlined evaluation tools for our bases to use in identifying targets of opportunity for

potential MILCON projects. In addition, our Compliance Environmental Strategy (COMPES) 2000 provided a proactive foundation for anticipating and incorporating future requirements into our planning process, and the POM.

STRATEGIC PLANNING

As we move toward the year 2000, we will be faced with a far different set of challenges than the

last decade. To must establish a

- ✓ one, identifies one of which is where we
- ✓ two, establishes which is our government in
- √ three, defines processes that objectives, and
- ✓ four, develop continually monitor and improve our processes.

OUR STRATEGIC PLAN

ENVIRONMENTAL FOCUS

LEAD THE FEDERAL GO VERNMENT
IN ENVIRONMENTAL STEWARDSHIP

ZERO WASTE; FULL COMPLIAN CE
QUICK AND COST EFFECTIVE CLEANUP;
PROACTIVE EIAP; COMPREHENSVE AUDITS
POLLUTION PREVENTION, COMPLIANCE,
RESTORATION, ANALYSIS, AND
POLICY & OVERSIGHT

TONS RECYCLED & DISPOSED
OPEN ENFORCEMENT ACTIONS,
SITES FINISHED, STUDIES DONE
ON TIME, # OF FINDINOS

meet these challenges, we clear frame work that: those Key Results Areas our environmental focus, should channel our efforts, goals we want to achieve desire to lead the federal environmental stewardship, objectives and the help us reach our

measurements to

POLLUTION PREVENTION

As a leader in the development and implementation of pollution prevention (P2) initiatives, ACC has created a solid foundation for this program. The key to successful waste minimization and recycling is teamwork. ACC's Cross-Functional Pollution Prevention team brings together a wealth of resources and expertise ready to tackle some of today's toughest problems. Our

partners in maintenance, maintenance, been developing an

"POLLUTION PREVENTION IS OUR FUTURE, AND PERHAPS, <u>THE MOST IMPORTANT PILLAR</u> OF OUR ENVIRONMENTAL PROGRAMS."

Ms. Sherri Wasserman Goodman, DUSD (Environmental Security) May 93 Statement to the House of Representatives

aircraft
vehicle
and supply have
instrumental in
environmental ethic

in their functional communities throughout the command. Environmental protection and pollution prevention are not only "the right thing to do" but also what we all must do to be successful. ACC invested \$3.2 million in FY 92 and \$7 million in FY 93 on pollution prevention requirements. New processes and equipment have been vital to a tenfold reduction or elimination of waste streams and the associated disposal costs, worker safety and training, plus present and future liabilities associated with clean-up costs and noncompliance penalties. Our P2 Outreach Program is dedicated to providing current technical information on P2 initiatives to our professionals in the field. Our mailing list has grown to over 750 customers throughout the Air Force, DOD, and other federal agencies.

Federal Leadership: The Tidewater Interagency Pollution Prevention Program (TIPPP), a

model partnership DOE and NASA Tidewater area, forum for front advocate for

"MR VICE PRESIDENT, WE LEAD THE FEDERAL GOVERNMENT IN THE POLLUTION PREVENTION ARENA." Gen Lob during Vice President Gore's visit to Langley AFB, 1 June 1993 between DOD, EPA, agencies in the Virginia provides a proactive line employees to resources and implement

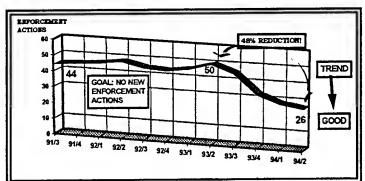
new ideas. The program has matured from its initial focus on hazardous waste minimization and now encompasses ways to reduce or eliminate ODCs, solid waste, and Volatile Organic Compounds (VOCs). Lessons learned have been transmitted across the command and the rest of the Air Force.

Gathering and Analyzing Data: A waste stream identification is an essential precursor to effective waste reduction. ACC has invested \$2.5 million in P2 baseline surveys and opportunity assessments for 24 installations. The surveys identify all wastes - municipal, hazardous, air emissions, ODCs, and industrial -- produced on the installation. Opportunity assessments help the installation identify process improvements that can reduce or eliminate waste streams. In addition, the improved ACC HAZMIN database provides a valuable, user-friendly tool for the tracking of hazardous waste on each installation. The program is so successful three major commands have requested copies to use.

COMPLIANCE

Focusing on Strategic Objectives: One of our Environmental Measures is "no new Open Enforcement Actions". By focusing our attention to this effort we have made significant

reductions in enforcement command. The our comply with is a stable climate of our ability to resources is ability to



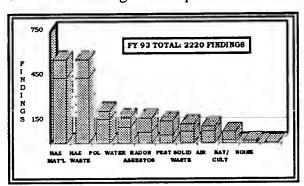
the number of actions within the key to maintaining commitment to environmental laws resource base. In a declining budgets, advocate for these dependent upon our clearly define needs

and impacts of noncompliance, both in terms or our responsibilities as good stewards of the environment, and the dollar impact of noncompliance and its subsequent adverse impact on the mission.

Partnerships: In order to ensure that we quickly execute the funds we are provided we've teamed with our 4400th Contracting Squadron to initiate the Environmental Compliance and Analysis Service Contract. These contracts reduce contract administrative time, increase the quality of the products and services our environmental flights provide to the installation and reduce costs by creating a competitive pool of contracted resources ready to deliver environmental analysis, compliance auditing and support services.

Measuring for Improvement: Measuring our compliance with federal and state laws is an

important part of program. ACC's Assessment and (ECAMP) is the DoD and is management tool commander's gauge progress and regulatory



our environmental
Environmental Compliance
Management Program
recognized as the best in
perhaps the best
available to help
their environmental
prepare them for
inspection. In response to

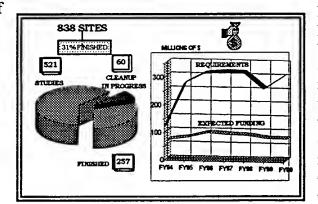
the impact on environmental programs from our closing bases, the base closure Environmental Assessment Team (BCEAT) was developed. This team supports closure installations by (1) Identifying closure-related environmental activities, (2) Ensuring continued environmental compliance until closure and (3) Aiding bases in meeting facility turnover requirements to the AF Base Closure Agency. During the past year, our program went through significant enhancements that included using wing vice commanders as team chiefs, adding ranges and missile sites to the assessment program and providing guidance to field units on providing internal assessments. Last year alone over 2200 noncompliance deficiency items were identified. These noncompliance items were corrected, saving potential fines and "taking work-out" for environmental flight personnel.

RESTORATION; A SHIFTING FOCUS

ACC has shifted its focus for the Installation Restoration Program (IRP) away from obligation rates (money spent) to more meaningful measures of progress. Although obligation rates are

important measures of execution of the holistically describe Measurable results contamination investment are much the true objective of pollution from the cost effectively. In developed the

report to track clean-



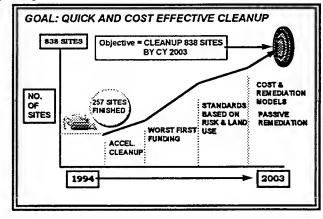
performance in the program, it does not this complex program. such as sites cleaned-up, removed, and return on more representative of the IRP -- to remove environment quickly and response, ACC has Commitment to Progress ups at each base.

The Commitment to Progress metrics:

- ✓ The number of IRP sites completed
- ✓ The amount of contaminated media processed via various technologies.
- ✓ The amount of contamination removed through those processes.
- ✓ The return on investments from various remedial actions
- ✓ Additional measurable results included in the Commitment to Progress report are the number Records of Decision (RODs) and Decision Documents (DDs) signed. To date, 1129 sites have been identified of which 348 are completed (31%).

Continuous Improvement Initiatives: During the past year, we have started several initiatives to do things "smarter and better." The Accelerated Cleanup Program (ACP) is one of those initiatives. The program provides fence to fence, cradle to grave clean up of the entire

installation's IRP money than the program. Expected exceed \$28 million 2000. Passive attenuation) is pursued by ACC. shortfalls and state influence on the



sites for less time and conventional clean up savings from the ACP from FY 94 through FY remediation (or natural another initiative being The past year's funding and federal; regulatory funding of low risk IRP

sites prompted ACC to seek a means for ensuring funds availability for high risk and legally required sites. The answer was passive remediation for low risk sites. ACC, therefore, implemented a pilot study through USGS to evaluate the use of passive remediation. The goals of the study are:

- ✓ To develop command standards and procedures for the use of passive remediation.
- ✓ To promote regulatory acceptance and normalization of passive remediation as a remedial technology.
- ✓ To conserve funds in the remediation of sites that present low risk to human health and the environment.

Partnerships with industry: ACC also started implementing the Rational National Standards Initiative (RNSI) and has begun negotiations with a number of Fortune 500 firms to negotiate with the EPA to have risked-based standards. RNSI will provide a means for identifying land use and establishing clean up standards based on risk and the proposed land use. For example, land proposed for residential use will require higher standards of clean up than land proposed for industrial or commercial use.

CONCLUSION:

Our objective is to aim higher, and blend environmental knowledge and ethics into every facet of our mission--Delivering Global Power for America-- and doing it environmentally sound which benefits our service and our nation.

REFERENCES:

- 1. Headquarters Air Combat Command, Civil Engineering Directorate, <u>Civil Engineering</u> Strategic Plan, October 1993.
- 2. Headquarters Air Combat Command, Civil Engineering Directorate, Environmental Division, Stakeholders Report, 1 July 1993.

PART IV

Quality in the Department of Defense in the Year 2000

Do Quality Concepts and Principles Apply in Combat?

PHOTO NOT AVAILABLE AT PRESS TIME

Lt Col Andrew S. Dichter

Biography not available at press time.

Do Quality Concepts and Principles Apply to Combat Operations?

by Lt Col Andrew S. Dicher, USAF

Do quality concepts and principles apply to combat operations? Does "quality" end when the shooting begins? One would think that the senior leaders of the Department of Defense would have considered and debated this important question in great detail before embracing the philosophy and implementing quality in the defense department. Secretary of Defense Frank Carlucci launched DOD on its quality journey in 1988, but provided all three services and the combat commanders great latitude in its implementation and no guidance on how it would affect combat operations. It has been over five years now since inception; DOD has experienced one major war and a few small skirmishes, but upon thorough examination of the record, surprisingly, there is very little written on the subject of combat and quality. When the subject is addressed, there are considerable differences on interpretations of what happens to quality when combat begins. One school of thought holds that:

total quality methods are fine for the widget factory but are incompatible with the swift judgment and immediate obedience required on the battlefield ... TQL is not appropriate on the battlefield2

Holding a contrary view, that the principles of quality continue to apply throughout the spectrum of conflict is General Michael Loh's view:

The Air Force that waged the most impressive air campaign in history didn't emerge by happenstance ... it is a product of the leadership style of our commanders.3

The thesis of this paper is that quality is not just a passing fad, nor a peacetime management technique, but a comprehensive strategic integrated system and leadership philosophy applicable in peace and war. In this paper, I will explore several key arguments against the applicability of quality to combat. Next, I will examine three important concepts necessary to understand and appreciate the link between quality and combat. Finally, this paper will examine the key tenets of the quality approach in achieving combat effectiveness. There are important exceptions, when time space relationships and critical decision-making force a temporary halt to quality mechanisms, but overall, there is a tremendous compatibility of the quality philosophy with that which is required to be effective in combat.

This paper assumes that the reader already has a solid working knowledge of the broad spectrum of total quality management (TQM), quality concepts, processes, and the implementation of quality throughout DOD. As such, I will only briefly elaborate on the specifics of quality theory, and only when necessary to clarify or validate

key concepts or points.

The Case Against: Quality Stops When Combat Begins

The very lack of material written on this subject supports the argument against quality being complimentary with combat. In a comprehensive survey of the Air University library materials and in working with the Air Force Quality Center, there are hundreds of books and articles written on quality. The quality revolution is a dynamic force in our country and gaining emphasis within the defense department, but no one has yet directly tackled the quality in combat controversy in any depth of study.

The Gulf War occurred only two years after DOD launched its quality initiative. In the aftermath analysis of that war, there were numerous articles written espousing theories on how Goldwater-Nichols, stealth, cruise missiles, technology, the information revolution, and of course, airpower, either single-handedly or in combination with other factors, "won the war." But, alas, no one rose to the forefront proclaiming how "quality won the war." The proponents of quality might argue that the war came too quickly after the launching of TQM to see any measurable effects. Opponents can argue that the lack of quality mechanisms during the war support the notion of combat and quality incompatibility.

Indeed, in examining some areas of the Desert Storm experiences, we see some disturbing conflicts between what are held to be important quality principles and what took place. Starting with the all important leadership element, General Schwartzkopf did not exemplify the quality leadership model. In general, the "quality" leader is seen as a mentor and coach, not a dictator. He listens and seeks inputs from others, is broad-minded, removes fear from the workplace, and overall, creates a working environment that inspires trust, teamwork, continuous improvement and pride.4 Anecdotal evidence from recent histories and accounts of the war paint a harsh picture of General Schwartzkopf that diverges considerably from the quality leadership model. For example, to cite a sample passage:

in his Riyadh war room (Schwartzkopf's) public mien disappeared, revealing a man of volcanic outbursts. ... His headquarters, swept with his verbal grapeshot month after month, became a dispirited bunker, where initiative withered and even senior generals hesitated to bring him unpleasant tidings. Instead, when the tirades began, they sat with eyes glassy and averted in what came to be called the "stunned mullet look," until his fury spent itself.5

Another example from the Gulf War experience that digresses from the ideal quality model is the "Black Hole" planning group. When problems developed with the air campaign and tasking system, rather than using a process approach to identify and correct problems, the "black hole" planning group emerged. This group assumed the lead responsibility for shaping the air campaign and producing the daily air tasking orders. However, the "black hole" was perceived as a stove-pipe organization which by-passed traditional staff responsibilities, closely controlled information and access, and caused considerable resentment among members of the USCENTCOM planning staff.6 The "black hole" did not embody the qualities of trust, teamwork, and a shared stake for everyone in the outcome--key principles of the quality philosophy and environment.

From a broader perspective, the key tenets of total quality management do not lend themselves easily to

application by the defense department as a whole and especially in combat. When DOD first launched the TQM initiative, DOD leaders cited four pillars that were key to understanding and adopting the new philosophy:7

- (1) Customer orientation (customer driven and responsive)
- (2) Quality of the product is defined by the customer
- (3) Concentration on processes and process improvement
- (4) People are the key (shared responsibility, leadership, participation, motivation, empowerment)

The military, particularly the combat arms, has had difficulty defining and focusing its customer orientation, the customer role, and its product. This becomes especially difficult when war and combat operations commence. There has been a tendency for DOD to identify its customer base from within its own institution, i.e., to view the CINCs, the major and combatant commands, and the user in the field, the soldier, sailor, airman and marine as its customers.8 Others argue that the ultimate customer is the taxpayer. Similarly, DOD's product, especially during war and combat, differs markedly from that of the corporate world. Who is the customer and what is the product when you are dealing with 2,000 pound laser guided bombs being delivered on a bunker?

In bridging the philosophy of the quality movement, which began in the manufacturing sector of Japan in the 1960's, to the military and combat arms, I hoped it might prove useful to turn to Carl Von Clausewitz, the renowned war strategist whose writings are frequently as relevant today as when they were written in the 1800's. There are those who subscribe to the belief that "we have always done TQM;" the quality movement is merely a trend that documents and describes, complete with its unique vernacular, how effective organizations have always operated. If so, then perhaps Clausewitz's insights could shed some insight and support to the quality in combat argument. Unfortunately, following a thorough review of Clausewitz's writings with a quality perspective, the converse is frequently more supportable.

Given the importance of such quality tenets as teamwork, participatory decision-making/problem solving, empowerment, process analysis, continuous improvement, and metrics/predictability, the quality philosophy is at odds with most of Clausewitz's theories. Clausewitz's ideal leader is the military genius, whose qualities of intellect, staunchness, honor, courage, and strength of mind, are synthesized in a single, brilliant, decision-making persona. This contrasts sharply with the image of today's quality leader. Furthermore, for Clausewitz, war and combat is an art, not a science.

War is a realm of chance ... the factors on which action in war is based are wrapped in a realm of uncertainty.9

Clausewitz's descriptions of the fog and friction of war, the impact of fear in battle, the nature of battle, the importance of moral factors, his discussion of the culminating point, all combine to present significant challenges in translating these to quality terms and principles. In seeking support from other famous military strategists, Henri Jomini's philosophy, teachings, and principles of war are far more compatible with TQM. This is particularly true

regarding the emphasis on the scientific approach to warfare and on the importance afforded metrics. Jomini's attempt to measure and quantify the science of warfare is far more consistent with the teachings and principles of metrics applied by Deming and other TQM disciples. Unfortunately, Jomini fell out of favor with military scholars, when his theories could not withstand serious analysis in the aftermath of the American Civil War and other conflicts which followed.

There are, however, a few bright spots for quality in Clausewitz's teachings. Clausewitz's cause and effect analysis parallels process analysis; his discussion of the importance of "rapid and accurate decisions" and time and space relationships are vitally important in understanding when TQM stops and time sensitive crisis decision-making takes over; he provides useful insights for customer identification; and Clausewitz's solution to ease the friction of war, education and training, are very important factors in bridging quality with combat readiness today.

The Case For: Vital Concepts That Link Quality with Combat

Before undertaking the arguments supporting the applicability of quality in combat, there are three important concepts that are useful in understanding the link between quality and combat. These are:

- (1) Preparation in peace determines effectiveness in war
- (2) Combat is only a part of a much larger whole
- (3) Time space relationships have an impact on quality processes

As a career fighter pilot, it is axiomatic that how we train and preparein peace will be decisive in producing effectiveness in war.10 Air Force doctrine emphasizes that "training should prepare aerospace forces for combat" and that "training should be as realistic as possible."11 General John M. Loh, commander of Air Combat Command, the USAF's largest MAJCOM and provider of combat forces for the warfighting CINCs, echoes this sentiment when he talks about creating "an organization that will provide the world's best combat air forces."12 ACC is committed to quality in everything it does. "Quality is a culture that emphasizes training and hard work for continuous improvement."13 An Air Force committed to quality in peacetime will continue to use quality in war.

The Navy is similarly committed to quality and has launched Total Quality Leadership (TQL) as its "long term program to improve the way" it does business.14 In implementing its TQL program, the Navy recently took advantage of a unique opportunity, and established a complete Total Quality culture from the ground floor when it prepared and commissioned its newest carrier, the <u>George Washington</u> (CVN-73).15 For the past three years, the <u>George Washington</u> has served as a model TQL environment and has performed remarkably well in her initial operations shakedown. She won two consecutive Golden Anchors, has maintained a fatality-free safety record for three years, and is recognized for record-setting air operations.16 The Navy is committed to TQL and believes TQL improves combat readiness and the quality of life for Navy people and families.17

All four services are committed to quality and are embracing its concepts in peacetime training. How we train shapes our readiness. It is unlikely that the quality culture being developed will cease when hostilities begin.

It will be a quality philosophy and mindset that our nation's warriors carry with them when they are called into battle in the future.

A second important concept in appreciating how quality is vital to combat effectiveness is understanding that actual combat operations are only a part of a much larger whole when we are dealing with war. Furthermore, the combat arms form only a segment of the entire defense community during large scale conflict. A nation's infrastructure, its resources, its logistics train, combat support and combat service support all play vital roles in waging and winning wars. During the recent Gulf War, a vast support structure of supply, maintenance, communications, and medical support was called upon to move 540,000 tons of cargo and support over 500,000 people in a combat theater over 7,000 miles away.18

It is noteworthy that within DOD, perhaps the greatest inroads in the quality movement have occurred in those functions which support the front line combat units. Two recent studies of TQM implementation within DOD reveal that all of the services have had their greatest successes in the combat support, combat service support, and logistics arenas.19 The Air Force Systems Command (now Air Force Material Command), and especially its Air Logistics Centers, were at the forefront of the quality movement in the Air Force. The Navy's greatest successes with TQL have occurred in its industrial facilities, such as Navy Aviation Depot and Norfolk Naval Shipyard.20 Similarly, the Army's best examples of quality at work are in such support elements as Army Materiel Command and Communications-Electronics Command.

It is important to point out that for these units, their combat missions differ little from peacetime except for the magnitude, scale, and speed of their operations. Efficiencies gained through the practice of quality in these units are directly applicable in both peace and war. From the perspective of support units, quality doesn't stop when the shooting begins.

The third, and perhaps most important concept, vital to understand the role of quality in combat, is time. Quality emphasizes: a long term outlook; strategic quality planning; process analysis, study and improvement; and participatory management mechanisms. All of these take time. However, in the dangerous new world era, with its high technology, precision, and revolutionary information processing, the "time factor has assumed increasingly critical significance."21 A conflict appears to arise between the rapid-paced decision processes required in combat with the need for time to apply quality principles. There is considerable consensus, that due to the time factor,

TQL is not appropriate on the battlefield. The point of TQL is ... to improve the way we prepare for war--from strategy making to acquisition, to logistical support, to training ... not to manage the conduct of war.22

During fast-paced operations in a crisis situation when immediate action is required, ... the traditional authoritative form of decisionmaking is appropriate. the quality method of decisionmaking--thorough analysis, participation by all concerned, and consensus building--is not appropriate.23

Too often, when we think of combat, we think of only the tactical level of warfare, which is also the level

of warfare where time is most critical. To apply quality concepts to combat, we must broaden our perspective and take a comprehensive view that includes the operational and strategic levels of warfare. We should also take into account, that during war, the actual amount of time in direct combat engagements is very small in relation to the time performing other tasks. In his article, "Employing Air Power in the Twentyfirst Century," Colonel John Warden eloquently elaborates on this concept:

Thinking about war and actually conducting war require that we have a good understanding of what war is ... Too frequently, our vision of war concentrates almost exclusively on its most obvious manifestation—the clash of the contestants' fielded forces. Indeed, Clausewitz identified the battle as the essence of war. Perhaps, however, Clausewitz identified battle as the essence of war because from his vantage point in time and place, battle dominated the process of war... Clausewitz may have been right for his time and place and accompanying technology, but it is not clear today that the actual clash of men on the front is the only way or the best way to wage war. To the contrary, we suggest that it may be the most costly and least productive approach in perhaps the majority of cases.24

Warden believes that the Gulf War was won at the strategic level. It was the decisive dominance at the "idea" level, where campaign planning occurred, that produced the tremendous successes at the tactical level.

The Gulf War campaign planning did not occur overnight, but rather over a period of months. It was an iterative process, studied, modeled, brainstormed, and refined over time--in essence, it was a quality process, that provided the formula for success. Time is available at the strategic and operational levels, and when time is available, quality mechanisms can work. If we limit the discussion of combat to only the engagement phase at the tactical level, it is difficult to appreciate the compatibility of quality with combat. But a broader perspective of combat to include strategic and operational levels, where time is available, will allow quality mechanisms to produce truly outstanding results.

Quality Tenets at Work in Combat and War

The aforementioned concepts were vital in laying the groundwork for the strongest case supporting the applicability of quality to combat, the application of the principles of quality to a combat, or wartime, environment. In this final section, I will briefly examine several key quality concepts, highlight the four pillars of TQM cited earlier in this paper, and show how these quality tenets apply to achieving combat effectiveness.

The Customer. "The primacy of the customer is one of the most fundamental concepts in TQM."25 Therefore, it is vitally important to identify the customer in order to apply quality to combat. A survey of DOD quality literature provides little assistance, defining customers as "anyone for whom an organization or individual provides goods or services."26 Again turning to the master war theorist, Clausewitz, proves useful. Although he never used the term "customer," at the foundation of his explanation of what war is all about, Clausewitz identifies the key customers of warfare at the macro level.

The customers in war are the remarkable, or paradoxical trinity, comprised of: the people, the army (the military),

and the government.27 "The first and most critical step (regarding factors in quality practices) is to identify customer requirements: his wants, needs, and expectations."28

This most basic of quality principles is clearly manifested when combat occurs, and the military is held accountable to satisfy the demands of the remarkable trinity.29 One need only compare and contrast the "customer satisfaction" of the people, the government, and the military in the Vietnam and Gulf wars to gain an appreciation of the applicability of this important quality concept.

The Product: A product is broadly defined as "a thing produced by labor and efforts." 30 TQM is concerned with customers and processes that focus on quality outputs, "the products, materials, services, or information provided to customers (internal or external). 31 The defense department is a huge institution with many products and processes, but, with no single core product clearly defined. Again, at the macro level, I would argue that the core products of the military are: combat readiness in peace, and combat effectiveness in war. If one accepts this precept, and given that DOD as an institution is firmly committed to the philosophy and principles of quality, then there is an inextricable link between combat and quality.

Strategic Quality Planning. A key principle of TQM is its philosophy of long term planning with a constancy of purpose, and the process of determining the long-term vision and goals of an organization. An organization with the proper strategic vision will conduct itself and pursue its mission in such a way as to slice through the operational cloud cover of day-to-day business, gaining continuous access to the mountaintop from which to view and evaluate the terrain, the entire situation, even the future, all in order to direct day-to-day operations through the prism of clear and holistic strategic thinking.32

The primacy of the objective and a clear understanding of the mission is vitally important when dealing with the use of military force and especially in combat. World War II, Operation El Dorado Canyon (Libya, 1986), and Desert Storm provide outstanding examples where this quality principle was fulfilled with highly effective results. In contrast, where objectives were not clearly defined, such as Korea, Vietnam, and Lebanon (1986), disaster followed.

Process Orientation. A core TQM principle is its major focus on achieving continuous improvement through process identification and analysis. This systematic approach to achieving continuous improvement in quality is frequently explained through the Shewhart Cycle, also referred to as the Ishikawa Circle or Deming Wheel. The framework relies on the continuous, repetitious "Plan-Do-Study (or Check)-Act" cycle.33 Most TQM handbooks provide the Shewhart model as an easy to understand framework for the strategic planning and implementation process.34

During the "plan" phase, organizational and systems analysis is completed, strategic objectives (long term) and tactical objectives (short term) are determined and the implementation is planned. The "do" phase requires actual implementation. The "check/study" phase relies on performance measurement and during the "act" phase, an implementation review is conducted and the entire process is evaluated for improvement. Plans are revised as required and the cycle continues.

Now, lets apply this model to DOD, and its most recent application of combat, the Gulf War, and

specifically, the air campaign. For starters, the Department of Defense has hundreds, if not thousands of planners who perform the strategic planning function, the "plan" phase. They prepare and develop war and contingency plans. In peacetime, the "do" phase is occasionally simulated through exercises or war game analysis, but never actually implemented. Only in wartime and in combat does the Shewhart cycle come to fruition. When Desert Shield began, service planners took USCENTCOM CONPLAN 1002, The Defense of Saudi Arabia, off the shelf, began modifying it for the specific situation, and transitioned into the "do" phase. Although forces began deploying almost immediately, the "do" phase began in earnest on January 16th, 1991 when the first bombs and missiles were launched against Iraq. Due to the nature of warfare, the need for customer feedback was immediate, and the "check" phase became critical. Bomb Damage Assessment was never fast enough or accurate enough, which was not really surprising, given the difficulty of refining this process in peace. Finally, in the "act" phase, the process was adjusted; bombers were shifted to Scud missions, or away from Baghdad, or toward the Republican Guard--all in the interest of process improvement. In the complex decision-making environment of the Gulf War air campaign, we clearly see a case where the quality principle of process analysis and improvement (the Shewhart Cycle) became a reality in combat, rather than a model in peace.

People: the Most Precious Resource. The Air Force defines quality as "a leadership commitment and operating style that inspires trust, teamwork, and continuous improvement everywhere."35 That in itself highlights the vital importance of the final pillar that connects combat and quality: the people dimension.

The disciples of quality, Deming, Juran, and many others all recognize that quality starts with leadership. Teaching, encouraging, mentoring, setting the vision and goals for the organization, and establishing the proper working environment are the functions of leadership; they are equally applicable in peace and in combat. Few can explain it better than General John Michael Loh who says that:

Leadership is the art of inspiring others to achieve extraordinary goals and levels of performance. Leadership creates trust which leads to teamwork and the ability to work toward continuous improvement together in a mission-oriented way, rather than a functionally-oriented way.36

On teamwork, quality consultants have expended tremendous efforts explaining and teaching team concepts to managers.37 But, the importance of trust and teamwork in achieving warfighting effectiveness has long been understood and practiced by military combatants. Fighter aircraft tactics emphasize the vital importance of teamwork, virtually mandating formation flights of two to four aircraft with carefully defined mutual support responsibilities.38 Teamwork is essential in all combat units and becomes absolutely essential in war.

Another major tenet of quality is that "motivation is a function of growth from getting intrinsic rewards out of interesting and challenging work." 39 For those who serve in the profession of arms, combat is certainly the zenith of interesting and challenging work. TQM motivational theory further recognizes the importance of empowerment, "the act of placing accountability, authority, and responsibility for processes and products at the lowest possible level," in enhancing performance. For the fighter pilot "coming down the shoot" on a bombing run or engaged in an aerial dogfight, for the M1A1 tank crew engaged in battle, for the marine storming the beach, and

for the destroyer crew defending against Silkworm missiles, they find themselves fully empowered when the shooting starts. Again, we see can see quality principles fully actualized in combat situations.

Summary and Conclusion

In summary, this paper has shown that while there are some difficulties that occur when quality is applied to combat situations, overall, quality is a comprehensive leadership and management philosophy that does not stop when combat begins. TQM is an effective way to enhance combat readiness and training in peace. It pays huge dividends in efficiently providing the resources in the support and industrial base of DOD (those areas which most closely parallel industry). While some decision-making processes revert to classic authoritarian task models during fast-paced combat operations, other quality tenets come into far greater play when the shooting starts. Through the use of logic and by drawing upon the lessons of military history, military theory, and applying selected examples from the recent Gulf War experience, this paper has illustrated the compatibility of quality theory and practices during combat. As the military continues to draw down, and faced with uncertain threats, it will be essential that DOD use its scarce resources efficiently and effectively. The quality approach holds promise in sustaining our combat effectiveness in the challenging years ahead.

ENDNOTES

- (1) "DOD Implements Total Quality Management," OASD/PA News Release No. 418.88, 18 August 1988.
- (2) J. Daniel Howard, "The Only Way Ahead," Proceedings, June 1992, p 86.
- (3) Michael Loh, Speach to the Hampton Roads Quality Council, Hampton Va, 1 Oct 92. In addition, interviews with members of the Air Force Quality Center disclosed that they had heard General Loh say that quality principles do not stop when the shooting begins, but to date, he has not elaborated on that thesis to any great extent in any written articles.
- (4) Extracted from a variety of sources including The Quality Approach: Your Guide to Quality in Today's Air Force, USAF: The Air Force Quality Center, Maxwell AFB, AL, Chapter II, and Air War College lesson plans, most notably, Lesson 2104, "Quality Air Force and Senior Leadership," Maxwell AFB, Air War College, 31 August 1993.
- (5) Rick Atkinson, Crusade: The Untold Story of the Persian Gulf War, New York: Houghton Mifflin Company, 1993, pp 3-4.
- (6) This evidence is primarily anecdotal and is based on interviews with past members of the US Central Command staff, members of the Black Hole, and a variety of other sources. However, the very fact that an ad hoc group was formed instead of relying on or using in place mechanisms such as the Tactical Air Control System, numbered air force frag shops, or J-3 Planning Staff is evidence in and of itself.
- (7) Lauri A. Broedling (and others), "Total Quality Management--The View from the Top," Defense '91, Jan/Feb 1991, p 9.
- (8) Richard A. Dilorenzo, Quality Management for the Air Force and DOD, Wright Patterson Air Force Base, Ohio: AFIT, October 1991, p 4-4.
- (9) Carl Von Clausewitz, On War, Edited and translated by Michael Howard and Peter Paret, Princeton: Princeton Press, 1984, p 101.
- (10) The author, a graduate of the USAF Fighter Weapons Instructor Course, qualifies as an expert on fighter training as a command pilot with over 2500 flying hours, over 1400 hours of instructor time in fighter aircraft, and 138 hours of combat time.
- (11) Basic Aerospace Doctrine of the United States Air Force (AF Manual 1-1, Volume 1), Department of the Air Force, March 1992, p 18.
- (12) Lt Col Michael B. Perini, "Air combat command: Rapid, Decisive Airpower," Airman Magazine, December

1992, p 11.

- (13) IBID, p 14.
- (14) Admiral Frank B. Kelso II, "Total Quality Leadership: The Way of the Future," Proceedings, Naval Review, 1991, p 107.
- (15) Rear Admiral Robert Nutwell, "TQL at Sea," Proceedings, September 1993, pp 86-88.
- (16) 1BID, p 88.
- (17) IBID.
- (18) An outstanding book that details the importance of the contribution of the logistics effort in this war is William G. Pagonis', Moving Mountains: Lessons in Leadership and Logistics From the Gulf, Boston, Mass: Harvard Business School Press, 1992.
- (19) Carolyn Applegate (and others), "Total Quality Managment in Ten Exemplary Department of Defense Organizations: Lessons Learned, Innovative Practices, and Quality Measurements," Monterey, California: Naval Postgraduate School, November 1991, pp 6-9.
- (20) Cletus F. Wise, "Implementing Total Quality Management in the Department of Defense," Maxwell AFB, Alabama: An Air War College Research Report, April, 1991, pp 6-10.
- (21) General Charles G. Boyd, "Air Power Thinking: 'Request Unrestricted Climb,' Airpower Journal, Fall 1991, p
 7.
- (22) J. Daniel Howard, "The Only Way Ahead," p 86.
- (23) Admiral Robert Nutwell, "TQL at Sea," p 88.
- (24) Colonel John A. Warden, "Employing Air Power in the Twentyfirst Century," The Future of Air Power in the Aftermath of the Gulf War, eds. Richard H. Shultz and Robert L. Pfaltzgraff, Maxwell AFB: Air University

 Press, July 1992, p 62.
- (25) The TQM Transformation, ed. John Persico, Jr., New York: Quality Resources, p 134.
- (26) Quality Air Force Glossary, Maxwell AFB: Air Force Quality Center, January 1993.
- (27) Carl Von Clausewitz, On War, p 89.
- (28) Thomas J. Cartin, Principles and Practices of TQM, Milwaukee, Wl: ASQC Quality Press, 1993, p 84.
- (29) It is interesting to note that this definition of the customer is consistent with the Air Force vision statement which identifies 'America' as its customer. See "Building a Quality Air Force," (pamphlet), Washington
- DC: Air Force New Agency, 1992.
- (30) Random House Dictionary of the English Language, edited by Jess Stein, New York: Random House, 1986.
- (31) Quality Air Force Glossary.
- (32) William C. Bean, Strategic Planning That Makes Things Happen, Amherst, Mass: Human Resource Development Press, March 1993, p.7.
- (33) For a short, but effective explanation of the Shewhart cycle, refer to The Quality Approach, Maxwell AFB,
- AL: The Air Force Quality Center, Fall 1993, p IV-2.
- (34) William C. Bean, Strategic Planning.
- (35) USAF, The Quality Approach, p I-1.
- (36) General John Michael Loh, Speach to the National Quality Month Kick-Off at the Hampton Roads Quality Council, Hampton, VA, 1 October 1992.
- (37) Peter R. Scholtes, The Team Handbook, Madison, Wisconsin: Joiner Associates, Inc., August 1992 provides an excellent example of the detailed examination and emphasis being placed on teams by TQM advocates.
- (38) Refer to AF Manual 3-3 for an unclassified explanation of how teamwork is integral to fighter aircraft tactics.
- (39) Mary Walton, The Deming Management Method, New York: The Putnam Publishing Group, 1986.

Impact Of The Government Performance and Results Act In The Year 2000



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Impact Of The Government Performance and Results Act In The Year 2000

by

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Abstract

With the advent of the quality revolution, virtually every segment of our nation's economy is undergoing change to capitalize on its benefits. While there are many examples of individual agencies taking advantage of this opportunity, it has taken a sweeping reform in the form of the National Performance Review to focus on an across the board improvement in the federal government. The first "reinventing government" legislation, the Government Performance and Results Act of 1993 (GPRA, P. L. 103-62) has served to focus the attention of the entire federal sector on this critical effort. GPRA promises to improve performance throughout the federal government by the mandatory introduction of strategic planning, annual plans which establish performance goals and subsequent measurement and reporting on those efforts. All this takes place by the end of the decade. In 2001 the Office of Management and Budget (OMB) must recommend to Congress whether performance budgeting should be implemented throughout the federal sector. This would tie varying levels of performance to varying levels of funding and focus on output. Leading in to the required features of the law is a series of pilot programs: Performance Planning, Managerial Flexibility and Accountability and Performance Budgeting. Air Combat Command's (ACC) participation in the pilot programs provides the basis for examining how GPRA will impact the Air Force in the year 2000.

Introduction

It is important to restore the confidence of the American people in their government. It is important because, to the extent that our government works with greater efficiency and effectiveness and less unnecessary cost, it will strengthen the American economy as well as the bonds of our citizenship. This law holds a lot of promise to do both things. The legislation itself mainly involves the inner workings of government, things that most people don't think about and maybe don't ever want to think about. It requires the formulation of strategic plans, of setting yearly goals and targets for every program; of measuring and reporting how well programs actually perform to the targets set for them, and more accountability for achieving results. But we should view this structure in much simpler terms, terms that every

American should be able to identify with. The law simply requires that we chart a course for every endeavor that we take people's money for, see how well we are progressing, and tell the public how we are doing, stop the things that don't work, and never stop improving the things that we think are worth investing in. (2,2)

President Bill Clinton

These hopeful words by President Clinton portend increased efficiency and effectiveness in the stewardship of the American taxpayers' hard earned dollars. At the same time, however, it also suggests the confidence of the American people, at least in terms of financial stewardship, has yet to be fully earned. GPRA promises to help correct that situation.

GPRA is still in its early stages. Even though the Act provides for pilot programs to pave the way for successful implementation, and expectations for the Act are quite clear, there is presently only limited evidence on how GPRA will actually impact government in the year 2000. Even with sketchy data this paper will make the best assessment possible, under the circumstances, of that impact. The basis for that assessment will be a projection of ACC's present implementation of GPRA via the pilot programs. ACC volunteered to be a pilot for several reasons. First, quality is a way of life in ACC. We stress continuous improvement through performance measurement and thus have an immediate philosophical link with GPRA. GPRA's basic intent is to make government more responsive and accountable by measuring and reporting on performance, stripping away unneeded restrictions and, finally, by linking performance to budgets. It is therefore a logical step in ACC's quality journey as well as a major learning opportunity as we prepare for full implementation of the Act. As the operating command with the largest combat capability in the Air Force, our GPRA experience will provide valuable insight into the way the act may impact other commands. Three ACC wings, the 314th Air Wing at Little Rock AFB, the 20th Fighter Wing at Shaw AFB and the 355th Wing at Davis-Monthan AFB are our test beds.

After reviewing the background of GPRA, I will present a general overview of ACC and its GPRA participation. I will then address criteria for Performance Plan Pilot Project status and how they are addressed in ACC. Finally, I will explore how GPRA may shape how the DoD and the Air Force do business in the year 2000.

GPRA BACKGROUND

The "Summary Information on P.L. 103-62" provides a useful overview of GPRA:

GPRA requires Federal agencies to develop strategic plans prior to FY 1998; prepare annual plans setting performance goals beginning with FY 1999; and, report annually on actual performance compared to goals; the first report is due in March 2000. Agencies are allowed to waive administrative requirements and controls to provide greater managerial flexibility in exchange for greater accountability. Two sets of pilot projects are to be undertaken over the next several years to test and demonstrate annual performance plans and managerial accountability and flexibility. At the conclusion of the pilot projects, OMB and GAO

separately report to Congress in 1997 on the results and assess the Government's ability to begin full-scale implementation. A third set of pilot projects on performance budgeting (presenting the varying levels of performance that would result from different budgeted amounts) will be done during fiscal years 1998 and 1999. OMB reports to the President and to Congress in 2001 on the results of this set of pilots with recommendations on whether performance budgets should be required. (4, i)

GENERAL OVERVIEW OF AIR COMBAT COMMAND AND ITS GPRA PARTICIPATION

ACC is the major combatant command of the U.S. Air Force. It was created in June 1992 by integrating the resources of the former Strategic Air Command, Tactical Air Command, and Military Airlift Command. In building ACC, the Commander, General John Michael Loh, fully embraced the "continuous improvement" philosophy, and defined ACC quality as "a leadership commitment to an operating style which creates a working environment that promotes trust, teamwork, and continuous improvement in all that we do." As ACC embarks on the future, it recognizes the uncertainty of a dramatically different world and the economic impact of emerging national priorities. In continuing the quality journey, the GPRA Performance Measurement Pilot Project, as well as our ultimate participation in the Managerial Flexibility and Accountability pilot and the Performance Budgeting pilot will be essential steps in linking quality measures with cost. However, another reason for our participation is to help shape how this public law will be implemented: We feel our experience in pilot programs will be useful in providing real-world input to OMB as the agency responsible for GPRA implementation.

Mission: The ACC mission is to "provide the world's best Combat Air Forces, delivering rapid, decisive airpower, anywhere, anytime." ACC's force structure consists of bomber and fighter aircraft; command, control, communications and intelligence aircraft; reconnaissance aircraft; combat delivery aircraft and tankers; and rescue aircraft. As a force provider, ACC organizes, trains, equips, and maintains combat-ready forces capable of worldwide deployment and employment. ACC also ensures strategic air defense forces are ready to meet the challenges of peacetime air sovereignty and wartime air defense. ACC provides nuclear capable forces for the U.S. Strategic Command, and theater air forces for the five geographic, unified commands. ACC acts as spokesman for the three Combat Air Forces (Air Combat Command, Pacific Air Forces, United States Air Forces Europe), and the reserve components in acquiring new or improved systems and equipment. ACC also ensures the inter-operability and operational readiness of ACC-gained U.S. Air Force Reserve (USAFR) and Air National Guard (ANG) units.

ACC Organization: ACC is headquartered at Langley AFB, Virginia. Subordinate to ACC are four numbered air forces, each responsible for deploying combat air forces during wartime. ACC's 30 active duty wings are assigned to a numbered air force for war planning/fighting purposes; however, for day-to-day management direction and resource allocation, these wings report directly to HQ ACC. Other major ACC units include the USAF Weapons and Tactics Center at Nellis AFB, Nevada, and the USAF Air Warfare Center at Eglin AFB.

Wing Organization: Each ACC active duty wing is organized to enhance the ability for rapid deployment and employment of combat forces. The wing commander's immediate staff consists of specific functional offices whose responsibilities cover the entire wing organization, such as Safety, the Judge Advocate, and the Comptroller. The rest of the wing is organized into four groups: the Operations Group, the Logistics Group, the Support Group, and the Medical Group. Groups consist of two or more squadrons, which are the basic unit of production in the command.

Resources: Approximately 240,000 people make up the ACC total force (over 129,000 active duty members and civilian employees, and when mobilized, more than 111,000 members of the USAFR and ANG). ACC's weapons systems for the active duty force include over 1,640 aircraft. USAFR and ANG units have another 1,590 aircraft, for a total of 3,230 aircraft assigned to ACC. As of 14 June 1994, ACC had total obligation authority of \$5.1B in 16 appropriations for FY 94.

Current Operating Environment: ACC faces many challenges in providing global power capabilities while dealing with severe force drawdowns. The Air Force has reduced combat forces by 50 percent since 1988. ACC will ultimately close or realign 14 major bases. This command views base closure as a mission in itself, so the full energy of the closing organization is directed toward that purpose. At the same time, ACC commitments around the world have increased. Currently, ACC personnel are enforcing no-fly zones in Northern and Southern Iraq. ACC continues to support the war on drugs with hundreds of people performing counternarcotics operations in Central and South America, and dozens of people are involved in other operations from Bosnia to Rwanda.

ACC Strategic Planning Process: During FY 93, ACC greatly expanded the strategic planning process in all units. This process is integrated with the Quality Air Force (QAF) criteria, which is closely aligned with the Malcolm Baldridge National Quality Award criteria. Using the 1993 QAF criteria, HQ ACC and each ACC field unit will complete a unit self-assessment (USA) not later than 1 October 1994. Results of the USAs will be used to update the strategic plans in each unit. For the pilot project, HQ ACC will provide selected wings with the necessary activity-based cost accounting capability (possibly off-the-shelf software) and train personnel during FY 94. The FY95 strategic plan of the selected wings will incorporate performance-based costing and performance-based measurement.

ACC GPRA Working Group: To develop the pilot project, the ACC Commander has formed a multi-functional GPRA Working Group, led by the Comptroller (FM). Other HQ ACC Staff members include: (a) Plans and Programs (XP); (b) Operations (DO); (c) Logistics (LG); (d) Civil Engineering (CE); (e) Services (SV); Communications-Computer Systems (SC); and Quality Improvement (QI). This group will assist our pilot wings in all phases of the GPRA effort.

GPRA Administration: The Office of Management and Budget (OMB) serves in an executive agent capacity. In the Department of Defense, the Office of the Secretary of Defense, Comptroller, (OSD, (C)), is the primary focal point, with assistance from the Defense Performance Review Office of the National Performance Review. SAF/FM is the office of primary responsibility in the Air Staff.

CRITERIA FOR PILOT PROJECT STATUS AND HOW THEY ARE ADDRESSED IN ACC

In order to participate as a GPRA Performance Plan Pilot, each potential nominee had to demonstrate the organization was capable of fulfilling the responsibilities of the Performance Plan pilot. The following areas deal with the issues that are critical in ensuring success of the program. These are also important in that participation in the subsequent GPRA pilot programs, Managerial Flexibility and Accountability as well as Performance Budgeting, are dependent upon pilot participants being equally qualified in these critical areas.

Strategic Planning in ACC:

ACC strategic planning is based on the "Global Reach - Global Power" strategic plan for the whole Air Force. Key elements of the ACC strategic planning process include the vision, mission, goals and objectives as shown below:

Our Vision: Air Force people. . . building the world's most respected air and space force.

Our Mission: ACC professionals providing the world's best combat air forces, delivering rapid, decisive airpower, anytime, anywhere.

Goals and Objectives:

IMPROVE OUR COMBAT CAPABILITY by meeting ACC operations, logistics, support, and medical quality performance measures.

- Attain C-1 or C-2 readiness levels for all ACC and ACC-gained squadrons.
- Improve the overall realism of combat training with increased emphasis on joint, combined, and composite force training.
- Improve fighter, bomber, reconnaissance, theater combat delivery, rescue, C4I, and battle management rapid deployment capability.

EMBRACE A CULTURE OF ACC QUALITY in everything we do, creating a working climate that inspires trust, teamwork, and continuous improvement.

- Enhance mission performance through improved processes.
- Improve the work environment by encouraging the flow of new ideas.
- Improve communications to promote teamwork.
- Empower all our people to unleash the human spirit.

STRENGTHEN AIR COMBAT COMMAND as the provider of the world's best combat Air Forces--Delivering Rapid, Decisive Airpower--Anytime, Anywhere.

- Maintain a strong mission-oriented organization with a unique culture.
- Build on the vision of integrated airpower.

IMPROVE SAFETY PERFORMANCE by fostering our culture of safety in the air and on the ground . . . on - and off - duty.

- Maintain the FY93 ACC and ACC-gained aircraft mishap rate below 1.6.
- Maintain ACC and ACC-gained command-controlled aircraft mishap rate below 1.0.
- Continue to promote weapons and ground safety and our "We Care About You" program.

PROMOTE A LIFESTYLE OF WELLNESS AND FITNESS in all our people and their families through quality physical, mental, and spiritual programs.

- Encourage spiritual wholeness.
- Provide timely, compassionate, and quality health care that inspires trust and confidence.
- Maintain a healthy force through a comprehensive health promotion program that emphasizes physical fitness, weight control, and proper diet.

Each ACC wing, group and squadron has been tasked to verify that FY 94 unit plans are closely aligned with and support the overall thrust of ACC goals. As goals and objectives are set at each lower echelon of command, they become more specific and reflect the output of the unit. In terms of GPRA, however, each wing participating as a Performance Plan Pilot will submit a strategic plan for at least one year of their involvement. If a wing chooses to wait until submission of their FY 96 Performance Plan, they need only include their mission statement and goals they have selected for inclusion in their Performance Plan for FY 95; their strategic plan will be included with their FY 96 Performance Plan.

Performance Measures

ACC uses Quality Performance Measures (QPMs) at all levels throughout the command. These are measures that relate to mission production and customer satisfaction. Over 150 QPMs are measured at each ACC wing and compared with command-established standards in four areas: operations, logistics, support and medical. Examples of QPMs in the respective areas include: weapons delivery accuracy, successful airdrops, range utilization, and flying hours (operations); sortie utilization rate, supply issue effectiveness rate, repair cycle time, and aircraft fix rate (logistics); finance office customer satisfaction, military family housing turnaround time, official mail delivery, and property damage claims (support); and medical production cost, medical work unit cost, unscheduled readmissions, pharmacy quality index (medical). Data on QPMs are gathered monthly or quarterly at ACC wings and major organizations, and then reported quarterly for review by unit commanders, the ACC Commander and HQ ACC staff. Comments accompany the data to show trends or other systemic information, with suggestions on how to deal with the situation. Standards of performance can be adjusted up or down, depending on the need to reflect the reality of that particular QPM.

Each ACC unit accomplishes a Unit Self-Assessment (USA) at least annually using the QAF Criteria (described above in the ACC Overview). It is a fact-based, bottom-up examination of all key processes, products, and services of how an organization uses to meet its mission. The USA fully supports and aligns with our ACC operating style: to create a working climate that inspires trust, teamwork, quality and pride; give everyone a stake in the mission and its outcome; delegate

authority and responsibility; set goals, measure progress, and reward performance; deliver quality products to all customers; strive for a culture of continuous improvement, and make it better.

The ACC Inspector General (IG) administers two types of independent assessments of organizational performance: the Operational Readiness Inspection (ORI) and the Quality Air Force Assessment (QAFA). The ORI is a results-oriented evaluation of an organization's readiness to conduct prompt and sustained operations in wartime and to identify deficiencies that adversely impact on a unit's mission capability. One-fourth of ACC's units are evaluated each year using the ORI. The QAFA is a validation of a unit's USA. QAFAs are done annually at one-fourth of ACC's units. They provide an independent, objective look at the organization's efficiency and effectiveness using the QAF Criteria as a basis for the assessment. The QAFA focuses on quality, productivity, and customer satisfaction by diagnosing strengths and areas for improvement. The results are shared throughout the command to promote the use of best practices and to identify command benchmark candidates.

Evaluation of GPRA Participation Benefits:

Performance results will be measured against planned goals and objectives. The ACC GPRA working group will coordinate evaluation of benefits in accordance with GPRA program guidelines and the ACC Commander's guidance. Conclusive evaluation is still dependent upon completion of analysis following execution of FY 95 and FY 96 performance plans.

Unit Costs and GPRA:

Though costs per unit are not specifically required in the pilot, we need to progress along this road since it will eventually lead to performance budgeting. Valid cost per unit is also extremely valuable as an efficiency indicator in the continuous improvement of the process being measured. Our goal is to eventually apply a unit cost to every process--both direct mission and support. For the immediate future, we are examining activity based costing software and how to use it as a management tool. Activity based costing is a new way of thinking about costs. It aligns costs with process--precisely what we are trying to measure in our bottom line Quality Performance Measures. In the long run, auditable budget quality information will be required to feed both our process improvement efforts and our ability to charge for services rendered. To this end, a full cost accounting system may be required. The Defense Finance and Accounting Service (DFAS) is working on a system known as the Job Order Cost Accounting System II (JOCAS II), that may well be the cost accounting system of choice for non-industrially funded areas within DoD. Our goal is to use the best available technology to provide tools to foster quality in ACC and comply with the spirit of GPRA.

HOW GPRA MAY SHAPE DOING BUSINESS BY THE YEAR 2000

Attempting to gauge the impact and success of a program that is not yet operational is difficult at best. Still, there are some indications of what the likely nature of its impact, even six years down the road, will be. Given the emphasis on quality, strategic planning and enlightened management throughout the Air Force, and with the assumption that effort continues, as well as

the present course of GPRA, one can build a case that the impact will be fairly substantial by the year 2000. Perhaps this prospect is best reviewed by looking at each of the main thrusts of GPRA: performance planning, managerial flexibility and accountability, and performance budgeting.

Performance Planning

GPRA implementation should evolve to present performance information on the most important aspects of Defense. It should facilitate the development of consensus on how to best measure critical Defense outputs and outcomes. And, to be more than another layer of reporting, the process must be integrated with and reflect the expectations of planning and budgeting process and the Future Years Defense Plan. It is not a "Comptroller Program." Rather, it is a methodology to engage the DoD community at large in focusing on essential outputs and results at given resources levels. (3,16)

Dr. John J. Hamre Comptroller Department of Defense

From a performance planning point of view, it appears likely the Air Force would be leaning in that direction whether GPRA had come along, and fully implemented, or not. Considering the robust quality effort that presently appears to be taking root in the Air Force, and the attendant emphasis on executing the mission in a quality manner, as well as planning in as accurately as possible, the die seems to be cast for this change in attitude to be sustained. Dependent upon how comprehensive the present quality emphasis is institutionalized, there should not be many pockets in the Air Force by the Year 2000 that have not fully employed the concept of performance planning. However, given the fact that the performance plan is based on the strategic plan, and desired outcomes and goals are essentially derived from the strategic plan for inclusion in the performance plan (with achievement of those goals documented by the use of performance indicators), it would be difficult to suggest that the Air Force would not be close to the GPRA tenants of performance planning by the Year 2000. However, it may be equally difficult to suggest that GPRA is the primary reason the Air Force would be in that position. The Managerial Accountability and Flexibility is another story.

Managerial Flexibility and Accountability

While the stated purpose of this portion of the GPRA pilot series, to eliminate by waivers those non-statutory policies that hinder accomplishment of the performance plan goals, is a worthy one, it is not presently clear how effective that effort might be in the Air Force. Variables would include whether or not performance planning, per se, is widely adhered to in its present form, and how goals and objectives in the Air Force, at least in a general fashion, are impacted by those waivers that may have been identified and been successfully implemented.

Unfortunately, this pilot did not get off on as positive a start as some Performance Plan pilots desired. The insistence by the Office of Management and Budget that Performance Plan pilots wishing to apply to be a Managerial Flexibility and Accountability pilot identify regulations and procedures for which waivers would be requested as a condition of applying was in stark contrast to the initial approach to implementation of this legislation. The introduction of pilot programs to enhance the chances for success of the law itself, as well as presumably to learn more about how to do the actual implementation, reflected a keen insight into an effective approach to the problem of changing the way government does business. It was disappointing to see the change in direction reflecting the insistence that waivers be identified up front rather than during pilot execution. Nevertheless, the fact that a mechanism to request waivers, a potentially very powerful counterweight to excessive bureaucracy, is being seriously considered for full implementation of this important legislation is very good news.

Performance Budgeting

Performance budgeting is possibly the real "jewel in the crown" of the entire GPRA effort. A government challenged by the rigors of a massive national debt, a tough domestic agenda and a world with changing "rules of engagement" is quite likely to reach for the promises of performance budgeting.

Performance budgeting is likely to be a major factor in Air Force activity by the Year 2000 only if it is implemented throughout government. However, if it is implemented, it will represent change of extraordinary proportions. It is certainly critical that a key goal of the process be achievement of an improved budgeting capability without additional workload. With downsizing a way of life throughout most of the federal government, there will likely not be enough resources, either in terms of people or workload capacity, to enter into an effort that would add significantly to existing responsibilities.

In enacting the GPRA, Congress has provided us a mandate that federal managers begin to marshal their resources in ways that are consistent with Baldridge-style quality criteria...If the implementation of the GPRA successfully avoids the perfunctory creation of additional budgeting reporting requirements, opportunities for real improvements in federal productivity are close at hand. (5,15)

Even with the impetus of other legislation, such as the Chief Financial Officers Act of 1990, and the accompanying demand for more effective performance measurement, there is still room for improvement in the performance measurement arena. If GPRA is as successful as hoped, there will be no mistaking its impact.

Summary

There appears to be a building demand for information about GPRA and its impact; we receive calls with increasing frequency asking for general information and specific results. Realistically, there will be no real data base on the outcome of even ACC's Performance Plan pilots until sometime in the second quarter of FY 95 and even then it will be sketchy. However,

later in that fiscal year we should begin to see trends that will start the process of truly understanding how this program is influencing business at our three pilot wings.

Karen Cleary Alderman, Director of Performance Measures and Results, Office of the Secretary of Defense, Comptroller, feels the most important impact of GPRA are more management flexibility and delegation, stronger ties between effectiveness and cost, and change in the resource management process. She considers change in the resource management process to be the defining feature of the legislation.

Ultimately changing the resource management process is really what GPRA is all about. GPRA has the potential to be one of the most critical pieces of legislation in recent time. The impact on the Air Force in the Year 2000 will be substantial and will improve financial management considerably. If the resource management process is indeed changed for the better, and as suggested by President Clinton's remarks cited earlier the confidence of the American people in their government is restored, then the Government Performance and Results Act will have been extremely successful.

Conclusion

GPRA may have the most potential of any legislation in recent memory to impact the federal government in a such a creative and positive way. Using strategic plans, setting annual goals and measuring how well they are achieved all will improve accountability, and very likely, productivity. The possible introduction of performance budgeting, with the accompanying prospect of improved funding decisions, would be an important step in the quest for better government. If GPRA is successfully implemented, it may be the hope expressed by President Clinton to restore the confidence of the American people in their government can be fulfilled. That would perhaps be the most important impact of The Government Performance and Results Act in the Year 2000.

Works Cited

- 1. "ACC Quality Handbook," Langley Air Force Base, Virginia.
- 2. Clinton, President Bill, Remarks at the bill signing of the Government Performance and Results Act, Washington, D.C., August 3, 1993., cited in the Preliminary Draft, August 4, 1993, Government Performance and Results Act of 1993, P.L. 103-62, Implementation Plan.
- 3. Hamre, Dr. John J., "The Future of Financial Management." *The Armed Forces Comptroller*, Winter, 1994.
- 4. "Summary Information on P.L. 103-62," Preliminary Draft, August 4, 1993, Government Performance and Results Act of 1993, P.L. 103-62, Implementation Plan.
- 5. TIG Brief, January February, 1994.

Improving Access to Care: Yes You Can!



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Improving Access to Care: Yes You Can!

by

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Abstract

The 774th Medical Squadron Appointment Process Action Team, RAF Chicksands used the seven step method to make significant improvements. This team was empowered by the Clinic Executive Staff and the Clinic Quality Consultants. Team membership included two external customers (patients). Having patients on our team proved to be very beneficial and resulted in a paradigm shift for some team members. This PAT realized the importance of synergy from the very beginning. Respect for one another and accountability within ourselves were two factors that all team members believed in and enabled us to achieve improvement. Improvements were made to accessibility, timeliness and availability to medical appointments based on customer requirements. The team also found that improvements could be made by opening lines of communication between sections within the medical squadron. As the 774th Medical Squadron continues on its quality journey, we would like to share our experiences with others.

Introduction

Improving access to military medical care is not a unique challenge to RAF Chicksands, but a systematic one DOD-wide. What we were able to accomplish at RAF Chicksands was to improve and refine a complicated process while increasing appointments and access for our patients. The journey was not an easy one, but it was certainly a worthwhile one for our customers who benefited from improvements and the Process Action Team (PAT) members who saw this hard work turn into positive improvements. At last year's Quality Air Force Symposium I was excited to see the diverse approaches to quality improvement. As a customer of quality approaches or improvement techniques, I was always interested in lessons learned and actual outcomes. For that reason the initial part of this paper focuses on those items, while the remaining section follows the seven step QAF Continuous Improvement Process starting with Identify Improvement Opportunity and concluding with Plan for the Future.

Lessons Learned

- Opportunity statements must be focused on one or two processes that need improvement, not an entire system.
- PATs need a "Sunset Clause" of perhaps 6 months with a one time renewal of 6 months otherwise they become an entity unto themselves.
- There must be a buy-in or commitment by all PAT members to the QAF process.
- Training of PAT members as a team in group dynamics, norms and Quality Council expectations should be done initially and reviewed periodically to keep the PAT focused.
- Continuity of Team members is critical. In the military this may be more of a problem; however, ensuring PAT members will not PCS in the middle of the improvement cycle can save a lot of frustration and time.
- Put your customers on your PAT as members. Some of our best ideas, as well as strongest criticisms of non-complaint patients, came from our non-clinic patient customers.
- PATs create a synergy for focusing the fine tuning of processes within and outside the PAT realm of responsibility. There were many spin off ideas directly related to the opportunity statement, but these suggestions were given to the appropriate clinic section and implemented where possible.

Outcomes

- Patient access for routine appointments increased
- Patients can make appointments in person without using an appointment phone
- Staff was "retrained" on patient sensitivity and awareness
- Patient complaints were reduced by greater than 95%

- Dependent sick call was established
- 10 additional parking spaces were built
- Establishment of Ambulatory Care Teams became an outgrowth of the PAT

Identify Improvement Opportunity

The Total Quality movement came to the medical clinic at RAF Chicksands in late 1991 and subsequently the formation of several PATs including one for the improvement of the clinic appointment system in 1992. The Quality Council at the time felt improvement in making a medical appointment was very much needed. This was reflected in the Clinic goals and objectives to improve patient sensitivity and access to care. It was also echoed by the Base population during an external needs survey where access to care was among the top three medical concerns. There was some internal feeling that the formation of the PAT was more a political statement than an actual agreement to improve the process. Whatever the real reason for the Quality Council's decision to form the PAT, it was an area where improvement was needed.

In interest of fairness the process of making an appointment in our system cuts across several, if not, all major departmental lines; i.e., stove pipes, and thus the potential for disconnects are multiplied, directly affecting patient's access to a medical appointment. It is a system with many processes and continuously changing variables with a constant need for communication and training among staff and patients alike.

The Quality Council, by consensus, agreed to charter a PAT with the following opportunity statement:

An opportunity exists to improve the appointment and scheduling process. This opportunity to improve was identified by inputs from the base population external needs assessment conducted in Feb 92, and evaluation by the Quality Council. The areas of improvement identified by the internal and external customers were:

- 1) Review of the provided scheduling input and mechanics of the scheduling process,
- 2) Evaluation of our patient sensitivity in relation to how the appointment process is conducted (to include patient privacy, staff friendliness, etc.),
- 3) Review of operator (appointment desk, providers, technician's, etc.) use of appointment process in terms of consistency, efficiency, accuracy, and convenience, and
- 4) Review ways to build in flexibility for patient/staff needs.

This process begins with the patient contacting the clinic, and ends when the patient checks in at the reception desk. The end result of improving the patient appointment process to provide the maximum amount of patient access to medical care, and increased satisfaction through ease of use by patient/staff personnel. It is of the importance to the base population as shown in the needs assessment, and the recurrent problems in employment of automation into the appointment process.

The initial PAT Team was formed with representatives of clinical services, patient administration, systems and nursing. This group struggled for many months and never really got beyond the evaluation phase. Much of that failure can be attributed to too large or encompassing opportunity statement, the group not adequately trained and key members, new leadership and membership were formed. The new group immediately focused on this mission and requested that the Quality Council reduce the scope of the opportunity statement to one or two key areas. This new opportunity statement is:

An opportunity exists to improve the 774th Medical Squadron appointment system. Starting when the Chief, Clinical Services (SGH) inputs the template to the Appointment Clerk and ends when the patient meets with a provider.

Evaluate the Process

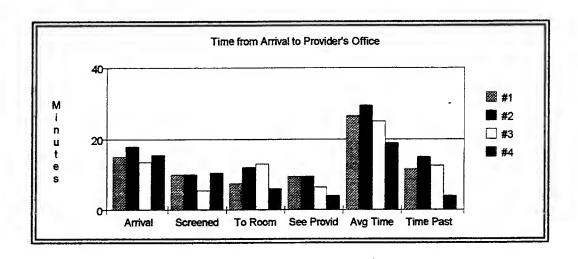
The PAT brainstormed ideas of how to evaluate the process and in particular what kind of questions to ask patients if surveys were used. In practice much data was available within the organization or could be tracked by logging patients in, computer generated data from automated appointment system, telephone consults and timing patients between arrival and actually seeing the provider.

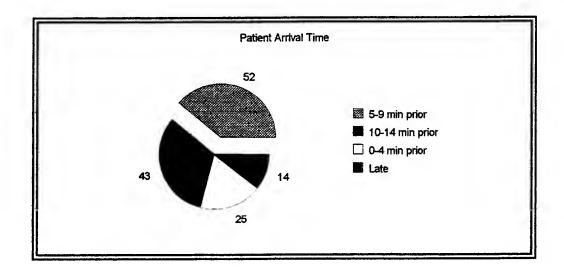
Establish Metrics

Operational Definition: The team decided gather data using two venues:

- 1. Customer Survey to determine possible root causes of complaints or other areas of improvement.
- 2. Data gathered by staff:
 - a. Time and reasons for phone consults
 - b. times of walk-ins
 - c. Patient arrival times for appointments
 - d. Who is making doctor follow up appointments
 - e. Time of each step after patient arrives

The patient survey allowed us to focus on what the customer felt needed the most improvement. As can be seen below the top four were: excessive time for next appointment, lack of a dependent sick call, waiting 15 minutes beyond appointment time and no parking near clinic.





Additional information collected allowed further analysis of patient arrival times, walk-ins, follow-up appointments and telephone consults. Results to the customer survey were used to determine where needs were being met and improvements could be made. A Validation Matrix was used to analyze the results.

Implement Solution

There appeared to be many areas that could be addressed for improvement. Finding the root cause was not as easy as it appeared because various attributes impacted on "successful" patient appointments. Some fixing was certainly in order and the new Chief, Clinic Services was more than willing to adjust schedules and try new approaches to improve patient access. Several PAT meetings took the form of reviewing data and graphs and suggesting some solutions.

Take Action: Implementing Solutions

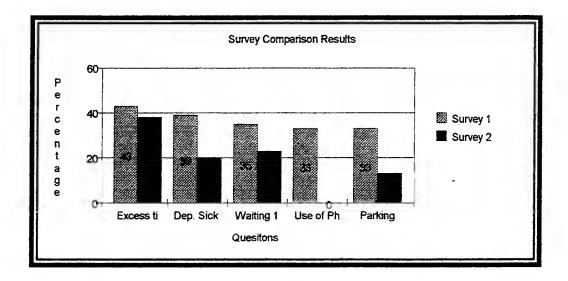
- 1. The Chief, Clinic Services has improved the schedules allowing more availability for appointments
- 2. Dependent Sick Call has been implemented for twice a week on Tuesday and Thursday afternoons
- 3. Patients are now allowed to make appointments in person
- 4. A new parking lot was made and an existing one was extended, adding a total of 10 more parking slots
- 5. A four month training program fro clinic staff has been established to address patient sensitivity
- 6. Clinic staff now have a policy of educating customers on appointments procedures every time an appointment is made

Check Results

A follow-up survey was conducted about 90 days after actions were taken. Among the top four areas where action was taken improvement was noted by the customers.

	% Needs Improvement	
	Jul 93	Feb 94
1. Excessive time till next appointment	43	38
2. Lack of Dependent Sick Call	39	20
3. Waiting 15 minutes beyond appointment time	35	23
4. Using clinic phone to schedule next appointment	33	0
5. Could not find parking at clinic	33	13

Additional improvements were noted in other areas surveyed which we attributed to patient sensitivity training carried out under the clinic goals and objectives program.



Standardize Solution

Revised methods for entering available appointments were incorporated into the appointment template. Periodic newspaper articles, educating patients on new procedures and reinforcing the importance of arriving 15 minutes before appointments, were placed in the base paper.

Training in the area of staff sensitivity continues. One major outcome of the PAT was the formation of Ambulatory Care Teams which allows continuing monitoring of key processes while methods of further improvement can be discussed.

New patient questionnaires have been developed to keep track of trends in accessibility and waiting times for patients.

A periodic review of next available routine appointments is conducted and briefed to the Clinic Professional Staff.

The Chief, Clinic Services now meets with the Appointment Clerk on a monthly basis.

Plan for the Future

Patient access is customer sensitive and time critical. To the patient who is ill, all the improvements we have made will not matter is they can not get into see a provider. Our plan calls for continuous monitoring of key variables while including patients, our key customers, in the solution process. Team meetings involving staff on Ambulatory Care Teams will continue to increase communication and build teamwork among the patient's first line of offense for better healthcare.

Improving Air Power's Contribution to the Air-Land Battle: Air Campaign Assessment



Lt Col Lynn D. Grinnell

Lt Col Lynn Grinnell is the HQ 1AF Quality Advisor at Tyndall AFB, Fl. Previously, she was at Headquarters, 4th Allied Tactical Air Force (4ATAF) in Heidelberg, Germany. Lt Col Grinnell was a member of the 4ATAF Operations Analysis team that developed the concept in this paper. An Air Weapons Controller, she holds the skill rating of Master of Air Defense. Lt Col Grinnell is a Master Quality Instructor and has a TQM Certificate from Florida State University.

IMPROVING AIR POWER'S CONTRIBUTION TO THE AIR-LAND BATTLE: AIR CAMPAIGN ASSESSMENT

by

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ABSTRACT

The premise of this paper is that air campaign planners need to develop <u>measurable</u> <u>objectives</u> in order to assess whether their plan of attack is working. This paper will examine the process of air campaign planning and the problematical parts of the planning process upon which the entire campaign plan hinges. Finally, it will give a recommended approach for the development of measurable objectives as a guideline for future planners.

ACKNOWLEDGMENTS

I would like to give a special acknowledgment to two people who were key to this project. The basic concept of measurable objectives and the methodology for air campaign assessment are the products of Col Rudolf Obermayer, German Air Force (GAF, retired). Col Obermayer was the Assistant Chief of Staff for Defensive Operations at HQ 4ATAF. He has been a battalion commander of a German Hawk Surface-to-Air Missile battalion and was a General Staff officer. I found his insight on the flow of air campaigns to be deeper than any of the experts in the research material I studied.

The translation of the concepts into actuality is largely the product of Lt Col Rich Grinnell, USAF, retired. Lt Col Grinnell was the Deputy Assistant Chief of Staff for Defensive Operations at HQ 4ATAF. As a weapons instructor in the F-106 and one of the first ten TAC pilots in the F-16, Lt Col Grinnell had extensive background in both defensive and offensive operations. His ability to analyze air campaign objectives and develop quantitative tools to measure them was equally rare.

My thanks to both of these gentlemen for the many hours of discussions which underlie the research in this paper.

INTRODUCTION

Exercises at the Warrior Preparation Center (WPC) in Einsiedlerhof, Germany, have brought some important concepts of air campaign planning into focus. The WPC is an interactive, simulated wargaming facility which trains senior leadership in air campaigning. Previous NATO command post exercises were based solely on scripted inputs; therefore, any campaign plan might be used because the outcome would not vary. Having to fight an interactive wargame with a thinking opponent, however, as is necessary at WPC, allowed us to check and act on our plan-do

cycle and to closely evaluate previous days' campaigns and revise them as necessary to reach long-term goals. A very important principle emerged: the need for measurable objectives.

We discovered we needed some basis on which to evaluate progress in accomplishing the objective. In order to design an air campaign over several days or weeks, planners need specific, achievable goals and a feedback mechanism to assess accomplishment of each goal.

REVIEW OF AIR CAMPAIGN PLANNING

Operational level planners go through a seven-step process in developing an air campaign.

Review available intelligence information.

The planner receives comprehensive briefings from intelligence analysts on enemy capabilities and recommended targets to hit.

Develop courses of action.² This is the broad brush description of how the air campaign is to be pursued over the next three to five days. The army commander's staff draws large arrows on maps describing when and where attacks and counter-attacks are planned. The air commander places emphasis, when necessary, on the establishment of air superiority. The air and ground commanders both determine when the army needs priority for air interdiction. For example, a typical description of a course of action would be to achieve air superiority on Day 1 and 2, then delay an enemy army at a choke point for 24 hours so that our forces can attack at our choice of place and time rather than the enemy's. That is later refined to allocate friendly forces against specific targets.

Determine weights of effort in each mission area (OCA, DCA, OAS, AI).³ The planners decide, based on the selected course of action and constraints in force, what percent of aircraft sorties should be assigned to air defense over our own territory, an OCA campaign against enemy bases/SAMs, and AI against army targets in the close-in or deep battle.

Develop a target list and match targets with numbers and types of aircraft.⁴ Given an enemy order of battle, the targeting section selects likely targets and, using aircraft and weapons capability planning guides, determines how many Tornados, F-111s, or other available aircraft need to be tasked to hit each target.

<u>Determining the role of each multi-role squadron.</u>⁵ In a maximum defensive posture, all capable squadrons would be roled to air defense. If the close-in battle needs more air support than is provided by dedicated aircraft, some squadrons may be re-roled to support army BAI or CAS requirements; also, if the army needs to delay enemy reinforcement ground forces or follow-on echelons, some multi-role squadrons may be re-roled to AI.

<u>Design air campaign waves/day.</u>⁶ In broad terms, each day's attacks are divided into waves with start times based on intelligence assessments of enemy vulnerabilities. Detailed planning and routing is then handled at the tactical level.

¹System Design and Integration Contract (SD&IC), 4ATAF New System Logical Model, Vol I - Data flow diagrams (Brussels: NACISA, 1990), p.52.

² Ibid.

³ Ibid.

⁴ Ibid.

⁵ Thid

⁶ Ibid.

Determine how special assets will be used (EW, AWACS, tankers, B-52s). Since such assets are scarce, their use needs to be prioritized. For instance, EW assets could be used for corridor operations in support of attack waves (generally along a narrow front), rollback operations (where enemy SAM forces are attrited along a fairly wide front progressively going deeper to minimize attrition), or hunter/killer operations (wild weasel pairs and air defense pairs working together against whatever threat appears). AWACS may have to be shared between adjacent areas. Tankers need to support deep attacks or intense air defense campaigns. The air campaign planner allots these forces to subordinate tactical air commanders to support the priorities of the air campaign.

CRITICAL POINTS IN THE AIR CAMPAIGN PROCESS

There are four points which are critical to the process of air campaign development: intelligence assessment, quantifying the objectives, evaluation of progress, and assessment of future needs.

Assessment of enemy capabilities and intentions. Assessing capabilities is standard practice for the intelligence community, but what is of vital importance to the planner is the intelligence assessment of the enemy's intentions. This allows the planner to prioritize targets and concentrate effort. This assessment is best made by studying enemy operational art and applying it to the situation at hand. Does the enemy initially try to establish SAM-free corridors? Does the enemy tie air power to support army operations? Is an army planning to cross a river during the next night? Many Intelligence analysts are shy about giving such assessments, but they are of critical importance to the success of an air campaign plan.

Quantifiable description of how well each task must be done. Objectives, as they have been defined in numerous publications and exercises, have traditionally been broad, sweeping statements which reflect motherhood and apple pie (e.g., gain and maintain a favorable air situation⁸; delay XX army by XX hour⁹). The job of the operational level planner should be to quantify these objectives so that wings can plan their operations better, so that the planner can assess and report to higher headquarters how well we are achieving the objective, and so that we can assess when to move on to the next objective. For example, must all SAM sites be destroyed, or will 70% destruction in specified areas provide sufficient freedom of movement and reduction of risk for "air superiority" to have been achieved? A measurable objective also means more to the individual pilot, who, as one pilot stated, understands very clearly that he will have to go back through heavy defenses to hit a target again if he doesn't do it right the first time - "great motivation!"

Evaluation of air campaign progress through the use of operations analysis. Ops analysis must do more than count losses, weapons expenditures, and exchange ratios. It must also be

⁷ Ibid.

⁸ Gover, "Air Supremacy -- The Enduring Principle", p. 60.

⁹ U.S. Congress Office of Technology Assessment, <u>New Technology for NATO</u> (Washington, D.C.: U.S. Government Printing Office, 1987), p. 76.

¹⁰ Raoul Alcala, "The United States and the Future of Land Warfare: The AirLand Battle" In Emerging Doctrines and Technologies, ed. Robert L. Pfaltzgraff, Jr, et al. (Lexington, Massachusetts: Lexington Books, 1988), p. 177.

¹¹ Interview with Lt Col Richard 5. Grinnell. USAF, HO 4ATAF, Heidelberg, Ge, 18 July 1990.

geared to examine and assess mission results, as well as the effect they are having on the enemy's air campaign. It must also be able to forecast what may happen with continuing operations using the same tactics.¹²

Assessment of assets required to accomplish subsequent missions. Very often, the critical point in the army's operations will come after several days of air campaigning. Since many of our air assets are capable of multiple missions -- air defense, OCA, or AI -- we might expend all air assets in the early stages of a campaign and not have sufficient assets to delay an enemy army at a critical time. The air campaign planner has to assess whether the war will be lost if the first mission is not accomplished, or whether the arrival of an enemy army at the wrong time or place would be more devastating.¹³

THE SOLUTION: MEASURABLE OBJECTIVES AND CAMPAIGN ASSESSMENT.

The answer to improving all four critical areas in air campaign planning is to improve the quality of air campaign objectives by making them measurable, and to assess the results based on damages done (the effect) in the campaign.

Defining an objective in measurable terms requires the planner to first determine what specific target sets will support the overall goal (e.g., SAM sites, EW bases, or bridges). Next the planner must decide how well the job must be done, and when, in order to be considered successful¹⁴ (e.g., 70% of the bridges must be unusable by day 3).

Following that, the planner must determine the weight of effort needed to attack those targets to achieve that success. Other targets should not be attacked unless they directly contribute to the objective (which may seem obvious to some, but is often ignored in the zeal to have maximum effort¹⁵).

The planner must also have a feedback system to allow analysis of attack waves through intelligence reports of battle damage. (NOTE: This feedback should include the percentage of damage reports received, since assessment and decisions may have to be made with incomplete information.¹⁶) We should not determine the success of a mission based on whether the pilot got bombs over the target.¹⁷ We must know the actual effect achieved in order to make further plans.

¹²Working sessions with Col Rudolf Obermayer, GAF, HQ 4ATAF at the Primary War Headquarters (location classified), 8-18 November, 1989.

¹³ Alcala, "The United States and the Future of Land Warfare", p. 177.

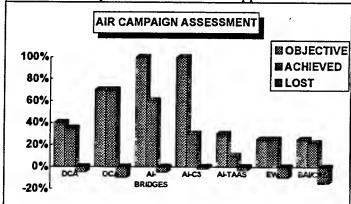
Working sessions with Lt Col Wilfred Reny, USAF, and Lt Col Thomas Bower, USA, HQ 4ATAF, at the Primary War Headquarters (location classified), 8-18 November, 1989.

¹⁵ Staff discussions with BGen Williams, CF, HQ 4ATAF, at the Primary War Headquarters (location classified), 14 November, 1989.

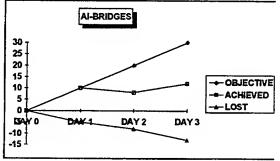
¹⁶ Discussions with Maj Gen Harald Hermes, USAF, HQ.

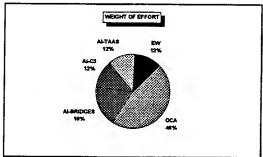
¹⁷ Working sessions with Lt Col Richard S. Grinnell, USAF, HQ 4ATAF, at the Primary War Headquarters (location classified), 8-18 November, 1989.

This feedback system must also describe the cost of the mission, in terms of aircraft lost or some other measure. Certain operations may be too costly in terms of attrition, or specific assets may have to be reprioritized to better support those missions.¹⁸



To do this in HQ 4ATAF, we created a chart (at left and below) which showed the objective against each target set, the results against each set, and the cost in terms of assets lost.

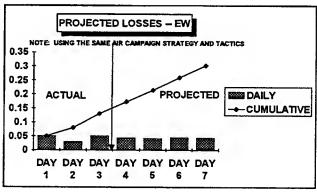




With this feedback, the planner can determine if adjustments to the campaign should be made by (a) adjusting the weight of effort, (b) shifting assets to affect the timing of the campaign, or (c) adjusting tactics if the costs are too high. Also, if the objective is accomplished, the planner can look at the courses of action already planned for the next three to five days to develop the next objective.¹⁹

We also showed the weight of effort (at left) as well so that the battle staff could see the effect of their decisions.

Finally, we showed attrition rates (below) and projected them to highlight possible effect if pursuing the same tactics and projected available resources for future campaign planning.



¹⁸ Working sessions with Col Rudolf Obermayer, GAF, HQ 4ATAF at the Primary War Headquarters (location classified), 8-18 November, 1989.

¹⁹ Interview with Lt Col Richard S. Grinnell, USAF, HQ 4ATAF, Heidelberg, Ge, 18 July 1990.

RECOMMENDATIONS

We need to implement a five-step process to better assess an air campaign:

1. <u>Assess enemy intentions</u>. Operational level headquarters must train both operations and intelligence personnel to make accurate operational assessments of enemy intentions. Air campaigns must be based on getting inside the enemy's timing cycle to disrupt his campaign.²⁰

2. Focus on target types to suit objectives. We must categorize targets (e.g., defensive aircraft base, EW aircraft base) to more easily identify the appropriate ones for each objective.

- 3. Determine how successful each mission or campaign phase must be. For each objective's target type, planners and intelligence officers together should determine the (a) expected enemy system/base capability; (b) probability of target kill or mission accomplishment (e.g., base closure for a specified period of time) by our weapons systems; (c) effectiveness of efforts to degrade their systems (e.g., jamming, stealth); and, what is very difficult to accept, (d) maximum acceptable attrition. For example, in the air superiority campaign, with those four numbers, it should be possible to calculate the number of enemy systems and/or bases which can be allowed to escape destruction/damage to make sure friendly attrition does not exceed the maximum acceptable. As another example, in an AI campaign the army can calculate the amount of time to go through a choke point (such as making a river crossing) based on the constraints (such as numbers of bridges). They can then calculate the amount of delay caused by each successful mission and determine how much effort is necessary to delay or channel the enemy until our forces are in preferred positions.²¹
- 4. Examine results based on quantitative measures. Using the comparison of weight of effort, effectiveness, and cost of mission, we can determine whether the major objectives are being accomplished. Operations analysis becomes key to the process of air campaign assessment since analysis of mission results will tell the planner how close we are to achieving the objective.²²
- 5. Finally, make an early determination of future needs. This will drive acceptable attrition rates and force planners to think unconventionally to achieve early success without sacrificing subsequent critical operations.²³

CONCLUSION

The air campaign must be designed to shape the third dimension of the battlefield and the enemy's timing to conduct the air battle on our own terms. Realistic planning and accurate feedback are vital to the successful conduct of an air campaign, especially with the lethality of third and fourth generation weapons systems and the scarcity of assets to conduct a costly campaign.

The solution proposed in this paper helps all four of the critical points in the planning process: it challenges intelligence analysts to provide more useful assessments to the planners; it quantifies the goals of the air campaign; it gives the planners the tools to assess whether those goals are achieved; and it provides planners the information needed for long range planning: forecasts of

²³ Ibid.

²⁰ Staff discussions with Col Rudolf Obermayer, GAF, HQ 4ATAF, Heidelberg, Ge, August 1989.

²¹ Interview with Lt Col Richard S. Grinnell, USAF, HQ 4ATAF, Heidelberg, Ge, 18 July 1990.

²² Working sessions with Col Rudolf Obermayer, GAF, HQ 4ATAF, at the Primary War Headquarters (location classified), 8-18 November, 1989.

assets available. By developing measurable objectives, the operational planner can make the assessments needed to make air power contribute its full potential to the Air-Land Battle.

BIBLIOGRAPHY

- Alcala, Raoul. "The United States and the Future of Land Warfare: The AirLand Battle".

 <u>Emerging Doctrine and Technologies</u>. Edited by Robert L. Pfaltzqraff, Jr et al. Lexington, Massachusetts: Lexington Books, 1988.
- Gover, Air Commodore P.D.L., RAF. "Air Supremacy- The Enduring Principle" In War in the <u>Third Dimension</u>, ed. Air Vice Marshall R.A. Mason, RAF. London: Brassey's Defence Publishers, 1986).
- Grinnell, Lt Col Richard S., USAF. HQ 4ATAF, Primary War Headquarters (location classified). Working sessions, 8-18 November, 1989.
- Grinnell, Lt Col Richard S., USAF. HQ 4ATAF, Heidelberg, Ge. Interview, 18 July 1990.
- Hermes, Major General Harald, USAF. HQ 4ATAF, Primary War Headquarters (location classified). Discussions, 12 November, 1989.
- Obermayer, Colonel Rudolf, GAF. HQ 4ATAF, Heidelberg, Ge. Staff discussions, March 1989.
- Obermayer, Colonel Rudolf, GAF. HQ 4ATAF, Heidelberg, Ge. Staff discussions, August 1989.
- Obermayer, Colonel Rudolf, GAF. HQ 4ATAF, Primary War Headquarters (location classified). Working sessions, 8-18 November, 1989.
- Reny, Lt Col Wilfred, USAF. HQ 4ATAF, Primary War Headquarters (location classified). Working sessions, 8-18 November, 1989.
- System Design and Integration Contract (SD&IC). <u>4ATAF New System Logical Model</u>, Vol I Data Flow Diagrams. Brussels: NACISA, 1990
- U.S. Congress Office of Technology Assessment. <u>New Technology for NATO</u>. Washington, D.C.: U.S.Government Printing Office, 1987.
- Williams, BGen Don, CF. HQ 4ATAF, Primary War Headquarters (location classified). Staff discussions, 14 November, 1969.

PART V

Quality Air Force in the Year 2000

A Planning Assessment Tool for Benchmarking Teams



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A Planning Assessment Tool for Benchmarking Teams

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Abstract

To assure benchmarking success, benchmarking teams must sufficiently plan their benchmarking activities. This paper is intended for teams to assess their readiness to conduct process benchmarking. Presented here is a series of questions teams can use to ask themselves: Have we sufficiently addressed the planning phase of our benchmarking study?

Introduction

Process benchmarking is becoming a hot topic as the U.S. Air Force seeks to shape its future with quality improvement initiatives. Air Force members are beginning to hear the word "benchmarking" and related terminology more frequently as the Quality Air Force criteria impacts organizations. One reason for this is that "most of the Malcolm Baldrige National Quality Award winners cite benchmarking as a key enabler for their quality improvement efforts" (Watson, *Strategic* 187). Benchmarking truly is a wonderful methodology, but like any methodology, the success associated with its use hinges on the planning phase of each benchmarking effort. This paper provides several checklists for benchmarking teams and organizational leaders to review when assessing the adequacy of the team's planning prior to collecting benchmark data. Thorough planning is essential to process benchmarking.

Overview of Benchmarking

"Benchmarking" has several descriptive definitions used throughout the benchmarking community. Many organizations have created their own definition as part of their company's official benchmarking procedure. There are, however, a few definitions well known to all members of the benchmarking community. David Kearns, former CEO of Xerox Corp, gave us perhaps the first formal definition of modern benchmarking: "Benchmarking is the continuous process of measuring products, services, and practices against the toughest competitors or those companies recognized as industry leaders" (Camp 10).

The International Benchmarking Clearinghouse (IBC) design steering committee developed a more comprehensive definition based on a consensus of some 100 companies: "Benchmarking is a systematic and continous measurement process; a process of continuously measuring and comparing an organization's [operational and] business

processes against [operational and] business process leaders anywhere in the world to gain information which will help the organization take action to improve it's performance" (Watson, Strategic 3).

The definition this writer prefers comes from the Director of the IBC, Dr. Carla O'Dell: "Benchmarking is the practice of being humble enough to admit that someone else is better at something, and being wise enough to learn how to match and even surpass them at it" (Air Force Quality Institute Curriculum: Basics of Benchmarking).

One of the reasons for the variety of definitions is the variety of benchmarking methodologies. Other forms of benchmarking such as strategic and competitive benchmarking are important, but for the purposes of this discussion, and for most applications of benchmarking used in the U.S. Air Force, this paper is centered on process benchmarking. From reading the above definitions, a simpler definition of process benchmarking is easily distilled: Benchmarking is the process of finding and adapting best practices to improve your organization's performance.

Why benchmark your organization's processes? As an integral part of your organization's strategic plan, benchmarking provides a vehicle to attack successfully actionable objectives supporting key result areas (KRAs) of the unit's strategic plan. Benchmarking encourages "breakthrough" thinking to identify best practices regardless of source--internal or external to the organization. Benchmarking also accelerates the process of operational change and organizational improvement.

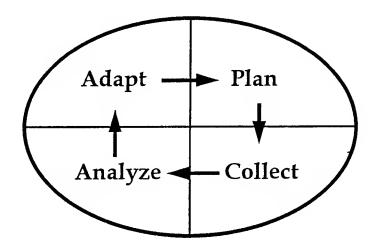
On a less formal level, benchmarking promotes an attitude of looking at one's organization with an external orientation. It becomes a mindset of constantly measuring your process against the "best in class" processes. Many people do this passively by reading trade journals, annual reports, and the *Wall Street Journal*. While this activity in and of itself is not benchmarking, it is a benchmarking activity.

The Benchmarking Process and Quality Air Force

Leading companies give us several prominent models for process benchmarking. Usually, these models include anywhere from ten to twenty steps. All models, however, have four basic steps or phases for any process benchmarking: 1) planning the benchmarking study, 2) collecting information, 3) analyzing the information, and 4) adapting (or implementing) the best practice. No detailed model fits the requirements of <u>all</u> benchmarking studies. Therefore, when considering the complexity of the benchmarking study, the number of steps within each phase and the variety and depth of the diagnostic planning questions may need to be specifically tailored to the study profile.

The benchmarking model looks like our old friend the Deming Wheel with its plan-do-study-act sequence, and like the Deming Wheel, this model is cyclical, too. Once the best practice is adapted, the benchmark must be periodically recalibrated by returning to the

four-phase benchmarking cycle. Benchmarkers typically suggest recalibration at least every three years.



Four-Phase Process Benchmarking Model

The benchmarking team accomplishes the first three phases; an implementation team accomplishes the fourth phase. Hopefully, after all the analysis is complete, cool heads will prevail and at least one member of the benchmarking team will serve on the implementation team to provide continuity of the benchmarking effort. Remember, if a team does not take positive action based on the benchmarking findings, the team is not benchmarking—it is merely collecting data. This is why implementation is still considered part of the benchmarking process. If, however, the benchmarking team finds its own practice to be *the* best practice, it will have no need to act on the data. The organization should celebrate such findings, but this heady experience should not keep the organizational leadership from revisiting the benchmark at a scheduled interval.

Briefly, the first phase (planning) includes the following steps (Air Force Quality Institute Curriculum: Basics of Benchmarking):

- 1. Form the benchmarking team
- 2. Regarding the scope of the study:
 - a. Select sub-processes with the most KRA impact
 - b. Identify functions involved
- 3. Define the process in terms of goals, work flows, and measures
- 4. Determine opportunities for improvement
- 5. Define topic areas for data collection

Before the team jumps into the second phase (data collection), the team should again review its charter to make sure it is properly focused. Additionally, the following battery of questions should be reviewed. These questions have been accumulated from various

sources and are provided as a checklist to assess the team's planning and readiness to benchmark; however, two important pre-planning questions must be asked before deciding to benchmark:

- Have we made a significant effort to see if someone else in my organization has recently benchmarked a process very *similar* to ours? (Balm 182).
- Have we checked to see if others have benchmarked this *particular* process recently and reviewed their results? (Kaiser).

Planning Phase Checklists

Checklist for the Team

1. Assessing our team composition:

- We have included appropriate people on our benchmarking project team to assure proper team expertise and maturity and to smooth the path for implementing changes resulting from benchmarking recommendations (Balm 183).
- Our benchmarking team members have been selected based on the criteria of ability and motivation (Spendolini 103).
- The team is open to new ideas and creativity and innovativeness in our application to existing processes (Camp 37).
- Process owners serve as team members or are strongly represented on the benchmarking team.
- One team member is a trained facilitator or we will have access to one.
- The team leader will serve as an effective liaison between the team and senior organizational leadership
- The process is within our team's sphere of influence (Kaiser).

2. Assessing our training:

- We have received appropriate benchmarking information and education through classes, reading, or consultation to assure an effective benchmarking experience and to maximize the probability of an appropriate return on investment of our organization's benchmarking (Balm 182).
- We have been trained on the various models available to support the complexity of our benchmarking study.
- Project planning tools (e.g., project planning calendars) are available to assist our benchmarking team. We have been trained to use effective project management techniques (Spendolini 103).
- We have a clear and comprehensive understanding of how our own work is conducted as a basis for comparison to industry best practices (Camp 37).

3. Assessing our individual responsibilities:

- Team members are willing to use the benchmarking model taught in the Basics of Benchmarking course (Kaiser; Camp 37) with or without an expanded model developed by the team.
- Each team member has personally reviewed and updated his/her understanding of our process, product, or service which we intend to benchmark (Balm 182).
- Each team member is aware of what organizational information must be protected, e.g., classified, "For Official Use Only" material, contracting information, and other organizational intellectual property.
- Each team member has read and agreed to follow the Benchmarking Code of Conduct.

Checklist for Key Organizational Leaders

1. Assessing our agreement to support a benchmarking study:

- We are actively committed to benchmarking (Camp 37).
- We are willing to change and adapt new practices based on benchmarking findings (Camp 37).
- We have reached a level of agreement on the objectives of the changes sought by the benchmarking study.
- We are committed to permit the team the time and budget to carry out the study (Watson, Benchmarking 42).
- The appropriate supervisors and us have factored the urgency and scheduling into the team's workload (Watson, *Benchmarking* 42).
- We have approved the major milestones set by the team.

2. Assessing our resource support for benchmarking activities:

- We have allocated sufficient resources to support the start-up of benchmarking teams (e.g., time funding, process support) (Spendolini 103).
- We have identified, trained, and oriented internal benchmarking specialists regarding their roles in supporting the benchmarking process (Spendolini 103).
- For this particular benchmarking study, we have identified and approved the necessary resources (Kaiser).
- We have empowered the organization's executive benchmarking champion to provide special benchmarking resources to support benchmarking studies.

3. Assessing our readiness to provide direction:

- We have informed the Command Benchmarking Champion or functional benchmarking coordinator (if one exists) of our benchmarking plan.
- We have clearly identified the sponsor (process owner) for this benchmarking study.
- We have provided the team an appropriate mission or charter (it is formally empowered) (Kaiser).

- We have determined and conveyed to the benchmarking team our desired reporting procedure (Watson, *Benchmarking* 42).
- We have obtained sufficient legal advice (at this time).

Checklist for the Benchmarked Process

1. Assessing the importance and scope of the study:

- This benchmarking study will directly impact a critical success factor (customer satisfaction, inventory turns, expense to revenue ratio, etc.) (Camp 44).
- We are using benchmarking in those areas causing the most trouble (Camp 44).
- We have reviewed KRAs with our customers (Spendolini 79).
- Based on a process profile, the process is "scope manageable." If not, we will look for a sub-process to benchmark (Kaiser).

2. Assessing customer involvment in the process:

- We know who our customers are (Watson, Benchmarking 25).
- We know what products and services we deliver to our customers (Watson, *Benchmarking* 25).
- We know what our customers expect or require of our products and services (Watson, Benchmarking 25).
- We have identified the factors responsible for customer satisfaction (Camp 44).
- We have identified the customers for the benchmarking information: 1) primary customers (users) and 2) secondary customers (others who can use the information) (Spendolini 79).
- We have sought out potential customers for benchmarking information and have contacted them (Spendolini 79).
- We have identified the benchmarking customers' requirements and have met personally with these customers (Spendolini 79).
- We have prepared a customer requirements summary and have reviewed it with the benchmarking customers (Spendolini 79).
- The benchmarking customers understand what is necessary to conduct the benchmarking investigation (e.g., time, funding, people) and are supportive of those resource requirements (Spendolini 79).

3. Assessing the present state of the process:

- We know our process and how it works (Watson, Benchmarking 25).
- We are aware of how well our process is performing today (Watson, Benchmarking 25).
- We know our performance goal and how we established that goal (Watson, *Benchmarking* 25).

- We know how our products and service performance compares with those of our competitors (Watson, *Benchmarking* 25).
- We have conducted process mapping (McNair 38).
- We have determined whether major problems or clear improvement opportunities with the process already have been addressed via problem solving or other work process improvement tools (Kaiser).
- The process is in reasonable shape (Kaiser).
- We have identified problems in the operation (Camp 44).
- We have identified the major cost components (Camp 44).
- We have identified the major deliverables of this area (Camp 44).

4. Assessing our ability to measure properly:

- KRAs have been specifically defined and, when possible, converted into measures (Spendolini 79).
- We have selected an appropriate set of measurements (usually customer viewpoint measurements) for benchmarking (Balm 182).
- Have we selected performance measurements? (Camp 44; McNair 38).
- How do we measure our process? (Watson, Benchmarking 25).

Conclusion

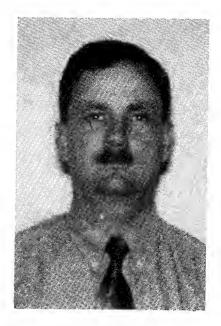
Planning occupies approximately fifty percent of the benchmarking team's time (if it's done right). Without the requisite attention to the planning phase, there is a great potential not to ask sufficiently probing questions in the data collection phase. Also, without sufficient planning, the analysis phase may uncover the team's inability to measure properly its own process. The team would then take three possible actions: 1) continue the study with the significant potential of failing to make "apples to apples" comparisons with the benchmarked organization(s); 2) postpone or cancel the study; or 3) revisit the planning phase and honestly answer these assessment questions. Thorough planning is time well invested.

Quality Air Force is all about continous process improvement (CPI) which is vital to shaping the future of the U.S Air Force. Benchmarking, as a structured methodology, is still a relatively new procedure residing within the CPI framework. Many organizations have not yet sufficiently traveled on their "quality journey" to reap easily the benefits of benchmarking. An October 1992 study conducted by Ernst and Young found only the top performing organizations received demonstrable benefits from benchmarking world-class organizations. The reason is because lower performers do not have the quality infrastructure necessary to implement best practices. Instead, as the study points out, the low performers need to spend their time on such things as developing teams, empowering their workers, and listening to their customers (Hequet). The process of answering these questions may help you determine if your organization has matured enough to reap the full benefits of process benchmarking.

Works Cited

- Air Force Quality Institute Curriculum: Basics of Benchmarking, co-developed by the American Productivity and Quality Center, May 1993
- Balm, Gerald J. <u>Benchmarking: A Practioner's Guide for Becoming and Staying Best of the Best</u>. Schaumburg: QPMA Press, 1992.
- Camp, Robert C. <u>Benchmarking: The Search for Industry Best Practices that Lead to Superior Performance</u>. Milwaukee: ASQC Quality Press, 1989.
- Hequet, Marc. "The Limits of Benchmarking." Training Feb. 93: 36.
- Kaiser, Steve J. "Ready for Benchmarking Checklist" prepared for Shell Oil Co.
- McNair, C. J. and Kathleen H.J. Leibfried. <u>Benchmarking: A Tool for Continuous Improvement</u>. Essex Junction: Oliver Wright Publications, 1992.
- Spendolini, Michael. The Benchmarking Book.
- Watson, Gregory H. Strategic Benchmarking. New York: John Wiley & Sons, 1993.
- ---. The Benchmarking Workbook. Portland: Productivity Press, 1992.

A Systems Approach to Software Development



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A SYSTEMS APPROACH TO SOFTWARE DEVELOPMENT

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Abstract

An analysis was performed on software metrics generated by a static code analyzer on software components currently residing in the Air Force Defense Software Repository System (AFDSRS) at Maxwell AFB, Alabama. All components were written in the same language, but come from a variety of sources. The desired outcome is to enhance the design and generation of software products written in Ada, and to show that Statistical Analysis can prove useful for software development in Ada and other languages. Code static analysis tools exist for all major programming languages and could be the beginning of viewing, quantifying and standardizing the art of Software Engineering using a Systems Approach. Univariate and multivariate Statistical Process Control (SPC) techniques along with Factor Analysis (FA) will be discussed as tools for evaluating software quality. The software products of the future will have to be more stringently designed and variation among products identified and minimized.

Introduction

A Software Development Facility (SDF) mimics the characteristics of a "Production Environment" that is typically the target of analysis using Software Process Control (SPC) techniques. An SDF should exhibit predictability in its output and products' quality that other "Production Environments" exhibit. Its products' quality should be able to be quantitatively measured for quality utilizing some of the same techniques. Anything less than a quantified set of metrics and processes to use them in making determination of the products' quality reduces us to the view of accepting software as a hammer:

Computer Integration cannot be a world class goal. Anything a computer does is in the same class as what a hammer does. Despite years of impressive technological improvements and investment, there is not yet any evidence that information technology is improving productivity or other measures of business performance on a large scale (Keith 1994).

Systems Approach to Software Metrics

As the size and complexities of software releases increase, newer approaches to measurement of software quality become necessary. A systems approach, which we will define as the methods,

operations, technical approaches, training, and requisite knowledge to evaluate and produce software components, gives us the ability to troubleshoot problems and improve quality in software before a system is released to the field. The cost of not implementing software quality programs has been estimated by Bellcore, the research and engineering arm of the Bell Operating Companies, at \$6,000,000 per major software system per company (Pence and Hon, 1993). The DoD spends approximately \$24 billion each year on software, and as much as 70% of this goes to maintenance on existing systems. An example of this same principle in the DoD is the software development costs for the F-16 being \$85 million versus a projected software maintenance costs over the life of the fighter as over \$250 million (Suydam, 1987).

A minimal set of operating assumptions have to be made in order to proceed. These assumptions for measuring software quality are:

- 1. Functionality of the software is mapped to a set of requirements. Components, hardware or software, should be mapped to some type of design that justifies their existence in a system,
- 2. Pieces should be functionally complete, meaning that code should compile just as hardware should function,
- 3. Don't test a broken piece for quality, i.e., if a piece can be seen to be defective by some means, there is no need to subject it to a complete quantitative analysis,
- 4. Components, depending on the criticality of the system into which they will be integrated, should have scaled degrees of reliability and traceability back to their source of origin.
- 5. Liability, licensing and certification of design and development professionals should be a goal.
- 6. Components should be analyzed and production monitored according to well-defined standards. A Quality oriented Certification Board should define these standards locally at an SDF.

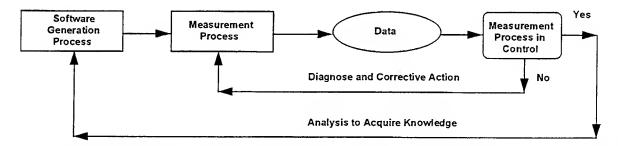


Figure 1. Systems Approach to Solving Software Problems (Hoerl, Hooper, Jacobs and Lucas, 1993)

Metric Selection

Ideal metrics should have 9 characteristics (Szymanski and Story, 1993). These are that they are definable, objective, valid, obtainable, measurable, understandable, cost effective, informative and reliable. Software components should be developed using a stuctured programming standard. Peer code reviews should ensure the components adhere to standards and are maintainable, reliable, reusable, and portable (Powers, 1993).

A report was generated on the AFDSRS Micro VAX 3900 compiling the component metric data for use into one report. The compiled statistics of interest included:

- 1. Lines of Code per component
- 2. Number of problem reports per component
- 3. Number of extractions per component
- 4. AdaMat Reliability Score (0-100)
- 5. AdaMat Maintainability Score (0-100)
- 6. AdaMat Portability Score (0-100)
- 7. AdaMat Reusability Score (0-100)

Data points were eliminated that did not contain a complete selection of items 4, 5, 6 and 7. Item 1 was rejected for analysis because although it traditionally has been used as a metric of choice for experienced programmers, there is a debate as to what a line of code actually is. Items 2 and 3 were rejected for study due to the fact that there seemed insufficient data to use. There was no easy way to determine if a component was actually used if it was selected and downloaded, and there was no easily quantifiable subclassification for problem reports. Items 4-7 were selected for analysis because:

- 1. They were generated by the static code analyzer AdaMat,
- 2. The tool has been "tuned" against accepted Air Force Ada coding standards,
- 3. And the features are quantitative measures of documented features in the coding standards that are generally accepted by the Air Force as Software Engineering measures of software quality.

A numerical composite of maintainability, reliability, portability, and reusability was selected to be a dependent variable in an additive model that could be considered as a metric of software quality for software written in Ada. Additionally a Factor Analysis was performed using items 4 - 7 as an input to a multivariate control chart. After filtering out incomplete data points, 637 software components were included in the analysis.

Maintainability, reliability, portability and reusability are normally thought of as "good" characteristics in the field of Software Engineering. If quality systems are a desire of an SDF then it could be argued that some quality metrics need to be identified and used to measure quality. The AdaMat scores lend themselves to this and a simple model that includes all of them is:

$$QI = \frac{X_1 + X_2 + X_3 + X_4}{4}$$

where χ_1 = AdaMat values of Maintainability

 χ_2 = AdaMat values of Portability

 χ_3 = AdaMat values of Reliability

 χ_4 = AdaMat values of Reusability

and QI = Quality Index, that is a simple arithmetic average of the 4.

Initially, descriptive statistics were calculated for all variables and tabulated using SPSS for Windows. A correlation matrix was generated for the four independent and one dependent variables. This table shows the means, standard deviations, minimum values, maximum values for all the variables.

Table 1. DESCRIPTIVE STATISTICS

<u>Variable</u>	<u>Mean</u>	Std Dev	Minimum	Maximum	N
RELIABLE	52.46	10.83	24.00	99.00	637
MAINTAIN	56.46	11.65	7.00	100.00	637
PORTABLE	87.36	5.60	48.00	100.00	637
REUSABLE	91.10	9.49	43.00	100.00	637
QI	71.85	5.98	45.50	99.00	637

Statistical Process Control (SPC) techniques were used to further analyze the data. AdaMat scores were analyzed to establish a picture of the process of software development via SPC charts. After ranking the values of the new dependent variable, QI, each independent variable was analyzed using SPC techniques in order to establish which features showed measurable amounts of variation when measured against QI. The variation sensitivity of such charts is well documented and is the main reason this approach was chosen. Again, SPSS for Windows was used to generate the graphs.

Charts such as these can be used to spot patterns in the behavior of the variation of the independent variables with respect to the dependent variable, QI. The value of this approach is that as general areas are recognized to contain more than just random variation, further examination of specific characteristics being measured can be analyzed to determine where the variations in the coding style are occurring. These can then be examined in detail during the review of the design/coding phase of the software development cycle. Changes made in this phase of the life cycle of a software system are the easiest to implement and the cheapest to fix. Points below the Lower Control Limit (LCL) become areas to examine for coding style violations and points above the Upper Control Limit (UCL) can be examined to see what is being done to have them stand out in a positive manner. High scores are not a problem. In fact, they merit closer examination for coding styles and techniques to be emulated. Since these charts are a variable plotted against another variable, they become in effect scatter plots with calculated control limits. They are a snapshot of software production characteristics over a large sample of programmers. What's interesting to see is the trends that can occur in the SPC plots even though the components come from several organizations. For clarification, corresponding scatter diagrams have been provided for comparison to the control charts.

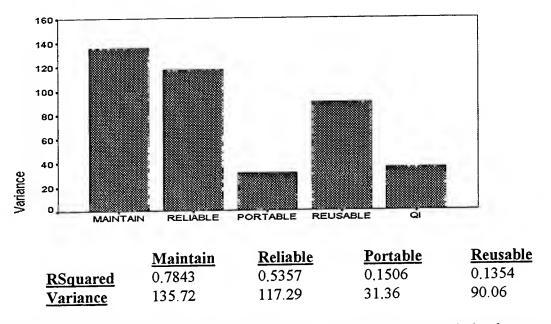


Figure 2. Histogram of Comparisom of Variances of Metrics. The interesting thing to note is that the measures with the highest values for variance had high values of rsquare and exhibited what appeared to be more noticeable trends over the range of QI. Variation detection using several tools is feasible.

Interpretation of the Results

The following charts are examples of each independent variable plotted against the ordered dependent variable, QI. This technique can be useful in spotting trends in the independent variables as the values of the QI increase and for identifying outliers.

Chart 1 (Reliability):

The charts display a large degree of variation and a high value of rsquared, but with an upward trend that implies as QI increases reliability increases. Closer examination of the particular coding parameters measured over time for this variable can point out possible improvements.

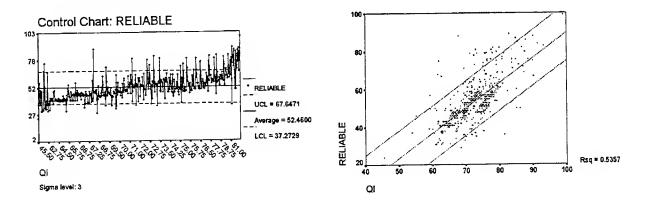
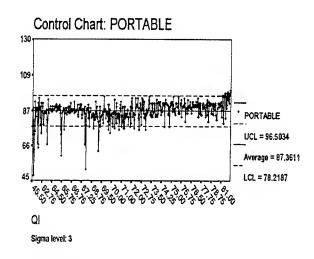


Chart 2 (Portability):

These charts display the second highest mean of any of the other independent values, the smallest 6 sigma range, and a small value of rsquared. The variation within the range is slight and seems to be of a random nature. Given the high relative value of the mean and the narrow 6 sigma limits, the implication is that this feature of software development is within process control limits as measured by AdaMat. The number of extreme low values seems to occur at the low end of the QI scale and then decrease at the high end. This suggests that even though the limits are fairly tight, as QI goes up, the portability outliers disappear.



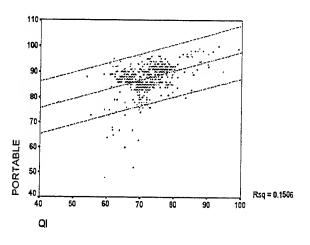
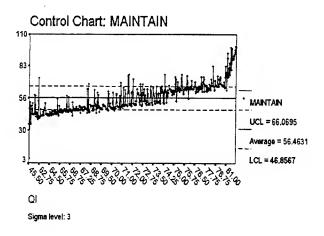


Chart 3 (Maintainability):

These charts display the widest range of variability, the widest 6 sigma limits of any of the other independent variables, and the highest value of rsquared. Notice the upwards trend in the values of QI as values of maintainability increase.



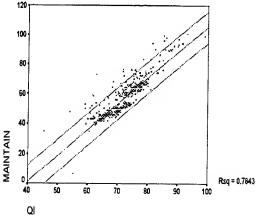
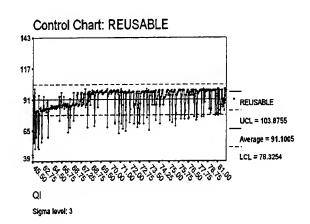
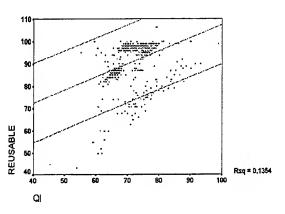


Chart 4 (Reusability):

These charts display the highest average of any of the other variables but also has the greatest degree of variability (Note the range of 25.55). It also has a low value of rsquared. There are numerous extreme values at the low end suggesting that some work in this area is still to be done even though on the average the scores tend high over the entire range of QI. Outliers occur over almost the entire range of QI, further suggesting that some features of reusability need to be studied for variation improvement.





Factor Analysis

Factor analysis is a method for reducing "p" correlated measurement variables to a smaller set of statistically independent linear combinations having certain unique properties with regard to characterizing individual differences. The first principal component is that weighted combination of several original variables that accounts for a maximum amount of the *total variation*, or individual differences, represented in the complete set of original variables. The second principal component is that weighted combination of the several original variables which of all possible weighted combinations uncorrelated to the first principal component, accounts for a maximum amount of the remaining variation or individual differences. The principles of statistical orthogonality (independence) and maximization of variance define principal components. Principal Components analysis should be used where the aim is to describe differences between individuals in a heterogeneous sample in terms of a few composite variables.

The primary result of factor analysis is a factor matrix that contains coefficients of relationship between the original variations and the factor variates. The coefficients in this matrix are called factor loadings. The nature of the derived factors can be interpreted or inferred from examination of the nature of the variables most highly correlated with each factor as contrasted with variables not so highly correlated (Rencher, 1992).

<u>Table 2. Extraction 1 for analysis 1, Factor Analysis (FA)</u>
Initial Statistics:

Variable Communality	Factor	Eigenvalue	Pct of Var	Cum Pct
MAINTAIN 1.00000	1	1.74303	43.6	43.6
RELIABLE 1.00000	2	1.04141	26.0	69.6
REUSABLE 1.00000	3	.99852	25.0	94.6
PORTABLE 1.00000	4	.21705	5.4	100.0
PC extracted 2 factors.				

Only the factors with eigenvalues > 1.0 were determined to be significant and were retained. This limited the analysis to the first two factors. These two factors accounted for almost 70% of the variation among the individual variables.

Upon looking at the Factor Matrix table, it can be seen that Factor I is most highly correlated with Maintainability and Reliability and that Factor II is most highly correlated with Reusability and Portability. Factor I will be referred to as the Maintainability-Reliability factor and Factor II will be referred to as the Reusability-Portability factor.

Table 3. Factor Matrix:

	Factor 1	Factor 2
MAINTAIN	.93947	.07302
RELIABLE	.81717	46470
REUSABLE	06757	.44780
PORTABLE	.43370	.78715

Table 4. Final Statistics:

Variable	Communality	Factor	Eigenvalue	Pct of Var	Cum Pct
MAINTAIN	.88793	1	1.74303	43.6	43.6
RELIABLE	.88371	2	1.04141	26.0	69.6
REUSABLE	.20509				
PORTABLE	.80771				

Rotation of factors is the process of redefining the factor axes so that they represent the original variables in a simpler and more meaningful way. The second step then, is to reposition the factor axes in order to achieve a more meaningful relationship to the original variates. A maximum variance or varimax approach was applied to the data.

Table 5. Varimax Rotated Factor Matrix:

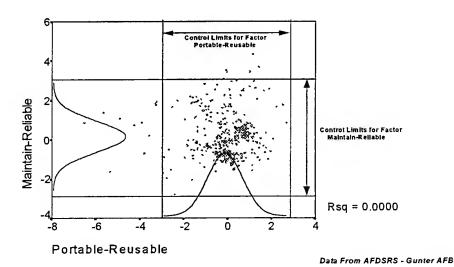
	Factor 1	Factor 2
MAINTAIN	.90594	.25926
RELIABLE	.89354	29206
REUSABLE	15568	.42527
PORTABLE	.26769	. <i>85793</i>

Table 6. Varimax Factor Transformation Matrix:

		Factor	1	Factor	2
Factor	1	.97984		.19980	(Maintain-Reliable Factor)
Factor	2	19980		.97984	(Reuasable-Portable Factor)

This data can now be used to construct a multivariate control chart of software scores generated from the original AdaMat scores that are orthogonal (or independent) of each other. A component can be measured and its location plotted on the chart to see how its Adamat metrics compare with the rest of the population. A common measurement instrument against a standard can overcome what has been referred to as the "not-invented-here-syndrome" (Herman, 1992). The rsquare value of 0 shows the orthogonality (independence) between the two factors, accomplished via the varimax rotation.

Multivariate Control Chart for Software Metric Scores
Using Factor Analysis to Reduce The Number of Variables
and Force Orthogonality of Factors



Conclusions.

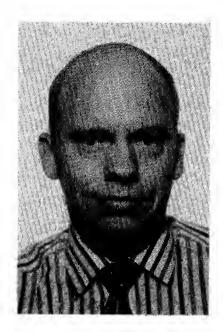
What has been demonstrated here is a possible systems approach for both variation detection and fault isolation using standard statistical SPC techniques in a software development environment. Internal variables have been examined and analyzed as suggested by Guy M. Jumarie (Schoderbek, Schoderbek, and Kefalas, 1990). Variation can be detected, isolated and analyzed with the aim of improving specific characteristics of the product just as it is done in a manufacturing environment. Although the language of study and the coding style analysis tool are specific to this population, the techniques of analysis could be used with any population. One critism of this approach might be to say that all we have done here is validate the tool. On the other hand, if a set of coding standards has been accepted by an agency or body, and a tool has been selected that measures the software against that set of standards, a significant step has been taken towards quantification and standardization. Isn't tool selection, calibration and validation part of a QA/QC process in a manufacturing environment?

Works Cited

- Herman, Robert, "Technology, Human Interaction, and Complexity: Reflections on Vehicular Traffic Science.", **Operations Research**, Mar-Apr 1992, Vol 40, No 2, pp 199-210.
- Hoerl, Roger W., Jeffrey H. Hooper, Peter J. Jacobs, and James M. Lucas, "Skills for Industrial Statisticians to Survive and Prosper in the Emerging Quality Environment.", **The American Statistician**. Nov 1993, Vol 47, No 4, pp 280-291.
- Keith Jr., Richard B., "MIS + TQM = QIS". Quality Progress, Apr 1994, pp. 29-31.
- Suydam, William, "CASE Makes Strides Towards Automated Software Development", Computer Design, Jan 1987, pp 49-70.
- Pence, J. L., and Samuel E. Hon, "Building Software Quality Into Telecommunications Network Systems.", **Quality Progress.**, Oct 1993, pp 95-97.
- Powers, Jacklyn, "TQM in Software Development Organizations.", <u>Quality Progress</u>, Jul 1993, pp 79-80.
- Rencher, Alvin C., "Interpretaion of Canonical Discriminant Functions, Canonical Variates, and Principal Components." <u>The American Statistician</u>, August 1992, Vol 46, No 3, pp 217-225.
- Schoderbek, Peter P., Charles G. Schoderbek, Asterios G. Kefalas, <u>Management</u>

 <u>Systems Conceptual Considerations</u>, 4th Edition, Boston Mass.: BPI,Irwin, 1990.
- Szymanski, Dr David J. and LtCol Douglas A. Story, . "Metrics and TQM: Are They Compatible?", <u>Crosstalk The Software Engineering Report</u>, Special Edition 1993, pp 24-26.

Analysis of the 1993 Chief of Staff of the Air Force Team Quality Award Selection Process: Was it Accurate? Can the Process Be Improved?



Dr. Paul M. Grunzke



SMSgt Gaylon Poston

Paul Grunzke has 20 years of Air Force military and civilian experience including three years of research and development in the Air Force Human Resources Laboratory/Operational Training division investigating flying training simulation; four years at AFMPC/DMPY analyzing personnel systems and surveys; six years at the USAFA Department of Behavioral Sciences and Leadership instructing Statistics, Experimental Design, Engineering Psychology and Human Factors; three years with AFIT obtaining a Ph.D. in Experimental Psychology at the University of Illinois at Urbana-Champaign; and four years with the Air Force Quality Institute (AFQI) as a researcher and consultant.

SMSgt Poston enlisted in the Air Force, May 5, 1969. He served as an Aerospace Ground Equipment (AGE) mechanic, shop inspector, and wing Quality Assurance inspector until 1976. He has 18 years experience in the Manpower Management career field, along with extensive knowledge in work sampling and operational audit techniques, management advisory studies, improvements in methods and practices, Fast Payback Capital (FASTCAP) investments and the Productivity Ehancement programs (PEP), and management of manpower resources by program element codes and the AF PBBS. He has served as a Detachment Chief and as Manpower Resources Chief. He is now assigned to the AF Quality Institute (AFQI) as a consultant, where he helped develop the process for nominating and awarding both the first ever CSAF Team Quality Award and the SECAF Unit Quality Award. SMSgt Poston received his M.A. in Management Science, Webster University (1990), B.S. in Psychology (1984), University of Maryland, and two A.A.S. degrees: AGE Technology (1983) & Human Resources Management (1980), CCAF, and is enrolled in Ph.D., Public Administration, University of Alabama. He is also a graduate of the AF Senior NCO Academy, Command NCO Academy, and Noncomissioned Officer Leadership School.

Analysis of the 1993 Chief of Staff of the

Air Force Team Quality Award Selection Process:

Was it Accurate?

Can the Process Be Improved?

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Abstract

The Chief of Staff of the Air Force (CSAF) Team Quality Awards (TQA) was instituted in 1993. The Air Force Quality Institute (AFQI) had significant involvement in administration of the entire TQA process. In this first, prototypical year particular attention was focused on the processes used to select the team champions. The AFQI awards team aggregated best practices gleaned from other team award processes, and gathered as much data as possible for subsequent analyses to help improve future TQA efforts. This paper addresses the reliability of team scoring, the impact of team presentations, and methodologies to improve the team evaluation process.

Historical Background

The Chief of Staff of the Air Force, General McPeak directed then HQ USAF/MOQ (now HQ USAF/PEQ) to be the policy makers for implementation of Quality Air Force (QAF) initiatives. One initiative was development of the Secretary of the Air Force (SECAF) Award and the Team Quality Award (TQA) procedures. The SECAF Award and TQA procedures were developed in a series of meetings started in October, 1992 that was chaired by HQ USAF/MOQ and was attended by MAJCOM quality representatives, AFRES, and then AFQC (now AFQI). This group laid the ground work for the prototypical awards process to be completed by FY93. Specific guidance from the group included:

- HQ USAF/PEQ retained the overall policy making function; PEQ selected the judges to score the team award packages
- AFQI was tasked to develop the TQA criteria; to administer the entire awards process, including training of judges; meeting the needs of all the teams selected to come to the 1993 Quality Air Force symposium; procurement of team champion trophies; and delivery of feedback to teams that entered the awards process

 MAJCOMs/FOAs/DRUs/HQ USAF and AFRES were responsible for screening team applications and forwarding a maximum of two nominees to AFQI by established deadlines

AFQI received 22 nomination packages and HQ USAF/PEQ selected ten judges to score the packages. The panel of judges included six general officers, one senior executive service civilian (general officer equivalent), and three MAJCOM senior enlisted advisors. Judges independently evaluated the packages using the CSAF Team Quality Award criteria. The criteria emphasized teamwork, sharing of best practices, promotion of continuous process improvement, and the appropriate use of metrics. Each package was examined for QAF approach, deployment, and results.

Scoring Team Quality Award Packages

Scoring the nomination packages was a very time consuming and toilsome task for the judges. Judges were not familiar with the TQA criteria, HQ USAF/PEQ and AFQI awards team expectations, nor the process for selecting the award recipients. After reading the complete package, a judge assigned a percentage to each element/sub-element based upon a comparison between the TQA criterion, and each package narrative and backup attachments. Percentages were recorded on the worksheet provided. After scoring was completed (except for team presentations which were completed at the symposium) judges transmitted scores to AFQI for aggregation. The average scoring time for judges was 3.0 to 3.5 hours per package. Upon receipt of all the score sheets from the judges, AFQI entered all the data onto a spreadsheet.

All judges attended the 1993 Quality Symposium to complete the scoring process since the 22 teams presented their story in 15 minute briefings to the judges over two days. The judges scored the briefings and total scores were recomputed each day during the judging. Each evening, the judges were briefed on the scores and relative ranking of the teams. The judges reviewed and discussed the teams' nomination packages, the presentations, and gained consensus on selection of the champions.

Five teams were selected as 1993 "Champions" and received the CSAF Team Quality Award trophies during the symposium banquet (October 21,1993).

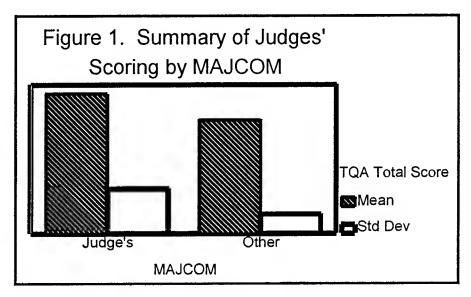
Analyses

Since this was the first ever Air Force Team Quality Award process several hypotheses/questions were of interest. Each of these hypotheses will be discussed in turn. They are:

- 1.) Did judges score their Major Air Command (MAJCOM) packages differently than other MAJCOM packages?
 - 2.) How reliable was the scoring process?

- 3.) What was the impact of the presentation scores?
- 4.) Could each judge be assigned fewer packages in a statistically controlled experimental design and keep a high level of reliability in the scoring process?

HYPOTHESIS 1: Ho: $\mu_{W/in}$ MAJCOM = $\mu_{external}$ MAJCOM To test whether judges scored packages from their MAJCOM differently from other MAJCOM packages an independent samples t-test was performed.

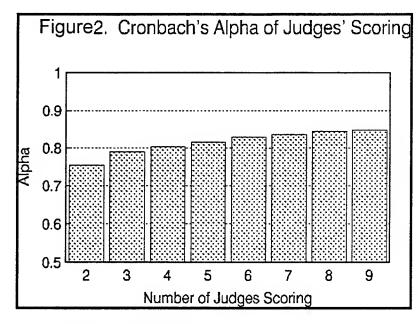


As can be seen in Figure
1, judges scored packages
from their MAJCOM
somewhat higher than the
remaining packages.
(Note: most judges
scored two packages
from their MAJCOM and
the remaining 20
packages from other
MAJCOMs or
organizations). While the
means were higher for
packages from their own
MAJCOMs so were the

standard deviations. An independent groups t-test revealed the difference in means to almost meet typical significance levels (t=1.90, p=0.059, 190 dfs) assuming equal variances. However Levene's test for equality of variances (F= 6.54, p=0.011) indicated variances were not equal. As mentioned above, the number of cases in each group were not equal. The t-test associated with unequal variance showed a lesser effect (t=1.34, p=0.199, 16.09 dfs) but that probability was due in great part to the decrease in degrees of freedom. While the null hypothesis cannot be proven, either t-test suggested some differences in scoring. The obvious solution was to have judges only score packages not in their MAJCOM. This policy would alleviate any bias to their own MAJCOM and would reduce their workload.

Question 2: How reliable was the judging process?

Typical reliability matrices have rows of subjects and columns of items (questions or variables) that make up a scale to be investigated. Our matrix had 22 rows of team total scores and nine columns of individual judges (that provided the total scores). Successive Cronbach's alphas (α) were completed for nine to two judges scoring to: 1) ascertain the overall estimate of reliability of the system as it was used, and 2) to roughly estimate how many fewer judges could be used while maintaining acceptable alpha (reliability levels).

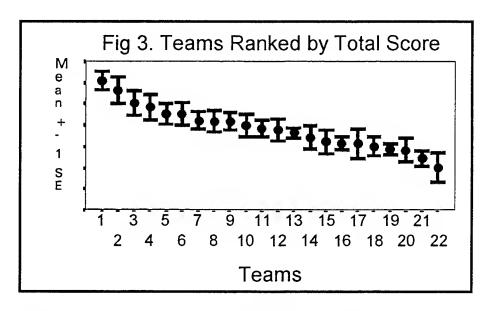


as indicated by Figure 3 below.

As demonstrated by the Figure 2, α ranged from 0.85 to 0.75 as a function of the number of judges. Reliabilities above 0.8 are often called acceptable. Based on these data, it would be possible to use half the number of judges and still maintain

 α at acceptable levels.

Another obvious simple analysis of the data was to plot the means of the total scores, arrayed from highest to lowest, for each team (summed across judges) with standard error bars,

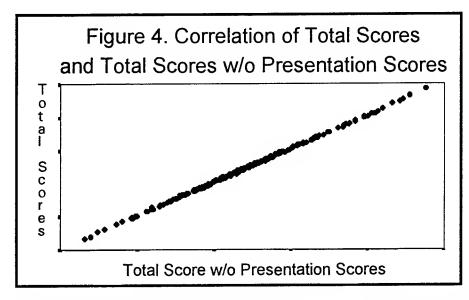


As is typical in behaviorally based data that has been scored by multiple individuals (judges), the mean total scores approximate a normal distribution with more scores closer together in the middle and fewer more spread apart scores in the tails of the distribution. We argued that selection of team champions from the

pool of 22 teams followed a psychological testing analogy.

It will be recalled that the error of measurement indicated the margin of error to be expected in an individual's score as a result of the unreliability of the test....If the primary function of psychological tests were to predict each individual's exact position in the criterion distribution, the outlook would be quite discouraging. When examined in the light of the error of estimate, most tests do not appear very efficient. In most testing situations, however, it is not necessary to predict the specific criterion performance of individual cases, but rather to determine which individuals will exceed a certain minimum standard of performance, or cutoff point, in the criterion (Anastasi, 66). The judges attempted to accomplish the quoted task. They established a criterion, or cutoff, for selection of the team champions.

Question 3: What was the impact of the presentation scores? This question arose during development of the TQA criteria. Considerable discussion was given to whether or not presentations should be part of the scoring of TQA process and if so what the point value should be. In the 1993 TQA process the point value was 2% or 20 points of the possible 1000 points.



The correlation between the presentation score and the total score excluding the presentation score was 0.36, a moderate relationship. However, the impact of that relationship was better depicted by Figure 4, in which the total score was correlated with the total score without the presentation score. The

correlation was almost perfect, in excess of 0.99, due to the extremely small point value of the presentation scoring. Further analyses revealed that increasing the weighting of the presentation scores (and decreasing the remaining scoring weights) did not have a great impact even when presentations were increased to 10% or 100 points of the 1000 points possible (using this data set).

Question 4: Could each judge be assigned fewer team award packages in a statistically controlled experimental design and keep a high level of reliability in the scoring process? Recall that Table 2 and the reliability analyses suggested fewer judges could be used while maintaining acceptable reliability. Obviously, if fewer judges were used each judge would be required to read more packages, a situation that was quite undesirable. The 1993 process of scoring could be configured as a repeated measures experimental design. Each judge reviewed all 22 team packages, so there was a judges effect, a package effect and an EXPERIMENTALLY unevaluable interaction of judging and packages (since the interaction was the error term and no within cell degrees of freedom were available). Without some assessment of this potential interaction teams could argue that they were rated by the hard or easy scoring judges which impacted the scoring process.

Greer recognized a similar problem in evaluation of Storage Technology Corporation's internal quality awards. His abstract stated, As the popularity of the award has increased, the evaluation of the applications has become a more critical activity. In this paper, I outline how the use of experimental design has helped to deal with some of the problems of examiner bias, inconsistency, subjectivity, and workload. I will also briefly show some of the analyses that are

used to identify award recipients and areas for potential improvement in the evaluation process (Greer, 1).

Storage Technology's first attempt to solve the problem was to randomly assign packages to a team of trained examiners, a process very similar to the 1993 TQA process. The data suggested a difference between scoring teams making direct comparison of applications difficult, exactly the same concern in the TQA process. Their solution was to forward the top application from each team of judges. This solution was effective only to the extent that each team had received a distribution of applications that were distributed in the same manner. Otherwise, the argument could be made that the number two ranked package in any given team was higher than the number one ranked, and forwarded, package of any other team.

The second round of scoring applicants by Storage Technology essentially replicated the first year's effort but added a feature of circulating each teams applicant packages for "limited evaluation" by other examiner teams. This procedure was an attempt to adjust for differences in scoring across teams, a non-experimentally designed covariate solution process. From this effort Greer learned that comparison of examiner teams was not an issue of bias but of inconsistency and variability in scoring.

The third round of scoring invoked use of experimental design to assist in the scoring process, precisely the direction proposed in this paper. "How can we best estimate and remove the effect of the 12 examiners simultaneously with determining the best applications (i.e., estimating the effect of the applications?)" In this form, the problem is easily recognizable as one which can be solved with an appropriate experimental design. So now our problem becomes one of determining a reasonable experimental design for a situation which can be described by a linear model in two qualitative factors, one having 12 levels and the other having 25 levels (Greer, 2).

Greer's solution was to require each application being evaluated 5 times. With 25 applications and 5 replications per application, twelve examiners had to review 125 (25 * 5) "applications" in a manner that minimized examiner effects, the stated goal of the experimental design. Seven examiners reviewed 10 applications and five reviewed 11 applications. Greer used a D-optimal design to complete the analyses. Using this design for the evaluation, we were able to identify the higher-scoring applications after initial individual scoring, based on the multiple regression analysis performed on the individual examiner scores (Greer, 2).

The fourth scoring round replicated the third round but furthered the analyses to include individual item areas, and not just total scores, again using a D-optimal design. The final conclusion made by Greer argued that use of experimental designs helped reduce subjectivity of the evaluation process and accounted for effects of multiple examiners, precisely our concern.

Table 1, below, shows a representation of all judges reviewing all the packages.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
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1_	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Х
2	x	x	x	x	x	x	x	x	х	Х	<u>x</u>	х	х	x	x	х	x	x	x	x	x	x
3	x	х	x	х	x	х	х	х	Х	Х	x	x	x	x	х	X	x	x	х	x	x	x
4	x	х	x	х	x	x	x	x	х	X	x	x	x	x	x	x	x	x	X	x	x	х
5	x	Х	х	Х	х	х	Х	x	X	X	х	x	x	x	х	x	x	х	х	х	х	х
6	х	х	х	х	х	х	х	х	X	X	Х	Х	x	х	Х	x	х	x	х	x	х	х
7	х	х	х	х	х	х	х	X	X	X	x	X	х	х	x	х	x	x	х	х	x	х
8	х	х	x	х	х	x	х	x	x	x	х	x	x	х	х	x	x	x	X	х	х	x
9	х	х	х	х	х	X	X	Х	X	X	x	x	х	x	x	x	x	x	х	х	х	х
1	x	х	x	Х	Х	x	Х	х	x	X	x	х	x	x	x	x	х	х	x	х	х	х
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Table 1. Full design with all judges reviewing all team packages.

Table 2, below, shows a notional reduced experimental design where the judges would have reviewed only about half the packages rather than all of them.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
		<u> </u>																				
1	х		X		х		х		x		x		x		х		х		х		х	
2		х		X		x		X		x		х		х		х		х		х		х
3	х		х		х		х		х		х		х		х		х		х		х	
4		x		х		x		х		х		х		х		х		х		х		х
5	х		Х		х		x		х		х		х		х		х		х		х	
6		x		x		х		x		х		х		х		х		х		х		х
7	x		х		х		х		Х		х		х		х		х		х		х	
8		х		x		x		X		х		х		х		х		х		x		х
9	х		х		х	-	х		х		х		х		х		х		х		х	
10		x		x		х		х		x		х		х		х		х		x		х

Table 2. Reduced experimental design requiring judges to review only a portion of the team packages.

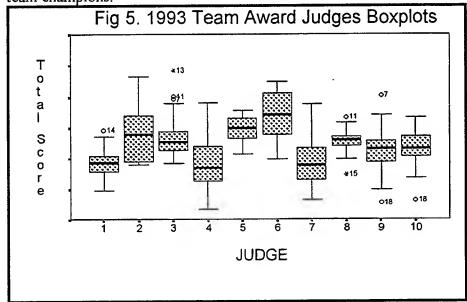
In a one between subjects (judges) and one within subjects (packages) mixed factorial design, the Table 1 design, the desired outcome would reveal no judging effects and strong team effects. Differences from that optimal pattern suggest somewhat less precision due to judge variability in scoring masking the true state of nature. The Analysis of Variance (ANOVA) in Table 3 below revealed statistically significant judge and team effects for the TQA process.

Table 3. Full Model ANOVA of 1993 TQA Data

Source	SS	DF	MS	F	p <
JUDGE ALLTEAMS JUDGE BY	2026411 2154337	.9 21	225156 102587	18.29 8.33	0.01 0.01
ALLTEAMS	2326314	189	12308		

This outcome indicated that judging was variant. With all judges scoring every package that outcome may not be a critical problem if judges were internally consistent, i.e., some judges were harder scorers than others. More difficult would be wide ranges in the variability of judges. Figure 5 presents the box plots of judges scoring to assist in understanding the ANOVA table.

Our data was similar to Greer's in that judge variation was present. However, the reliability analyses, and analysis of ranking of teams by judges (using total scores) indicated reasonable consistency in the process. Further, as mentioned, we adopted the psychological testing model in which the primary goal was to establish a reasonable criterion for selection of team champions.



We continued to analyze the reduced scoring model by arbitrarily selecting various 11 application package groupings (half the original data set) and subjecting them to the full effects analysis. The ANOVA tables were very similar, indicating little loss in precision of scoring while reducing

workload by one half. An exemplar ANOVA table is below in Table 4.

Table 4. Reduced Model ANOVA of 1993 TQA Data

Source	SS	DF	MS	F	p <
JUDGE ALLTEAMS JUDGE BY	1215511 938795	9 10	135056 93879	9.31 6.47	0.01
ALLTEAMS	1305592	90	14506		

Thus, our next step is selection of the 'best' design, such as balanced incomplete block designs, or other partial replication designs to use in future judging of the TQA. Reducing the number of packages for review by each judge and possibly reducing the number of judges needed while keeping the ability to examine the two main effects, judging and team total scores, will factor into our design selection. Even with use of a sophisticated experimental design, we plan to retain final consensus review of the scoring process and we plan to increase training of judges to minimize judging variation.

The prototype TQA process was a good initial effort. We produced specific recommendations for future TQA processes based on the data from the first effort. Our reduced experimental design judging process should decrease the scoring workload without compromising scoring effectiveness.

Works Cited

Anastasi, Anne. Psychological Testing, Fifth Edition. New York: MacMillan, 1982.

Greer, Daniel A. Quality Award Evaluation. Proceedings of 1994 American Statistical Association, Winter Meeting, January 7-9, 1994, Atlanta, GA.

Deploying Quality Management in an Air Force Medical Environment: A Change Perspective for the USAFA Academy Hospital.



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A graduate from the University of Vermont, since 1976 he has worked in both civilian and military settings at a variety of levels in nursing management. In 1991, he was selected for the Fellowship in Medical Quality Assurance at the AF Surgeon General's Office. While there, he created and edited the *Quality Review*, a world-wide newsletter, distributed to every USAF MTF.

Deploying Quality Management in an Air Force Medical Environment: A Change Perspective for the USAFA Academy Hospital.

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ABSTRACT

It is clear that Air Force supports Quality Management. Air Force has encouraged and supported the investment of literally hundreds of thousands of dollars in training, literature and promotion of quality concepts. Top leaders have openly endorsed the concept of continuous quality improvement, and have committed time and effort to the visioning process for the Air Force. During recent Corona Conferences, continuous improvement has been a major discussion topic for our general officers. The 1992 PFE Study Guide¹ dedicates one of its 17 chapters totally to "Quality Air Force" (QAF). The establishment of the Air Force Quality Center (AFQC) at Maxwell, the "Quality Air Force" initiative, and the "Quality Air Force Assessment" (QAFA, scheduled for early 1995), all demonstrate positive support and good intent by top leadership.

At face value, it seems clean and simple. "Quality Air Force". We support it. You do it. Air Force requires it, and so, will inspect it. But, has the true impact in the field been considered? Are these simple and clear goals and messages that will ultimately enhance organizational structure and outcome? Are our stated objectives targeting the right things, and does our strategic plan actually focus on the outcomes desired? Although we would not presume to answer these questions for the Air Force, the authors would like to outline one organization's perception, and experiences in reacting to the current environment of change, and provide the reader with a synopsis of its approach to establishing an effective and self-sustaining quality environment.

Challenges in the Health Care Environment -- an Introduction

While the 1980s represented the decade of "white-water rapids" for health care, the 1990s will be spent "going over the falls." Hospitals are challenged as never before to increase their "value" to consumers by improving quality while simultaneously decreasing costs. Integrated delivery systems will clearly become the structure of health care's future, regardless of which reform package is adopted in Washington. Air Force facilities are no longer exempt from these challenges. Current mandates require all branches of the military to initiate joint strategic planning efforts to maximize service delivery and minimize duplication.

The new imperative to develop integrated delivery systems takes on increasing urgency and complexity as capitated arrangements emerge -- transferring resources away from acute care and shifting them to outpatient and preventive services. As a result, hospitals themselves are being forced to radically change their modes of operation. The key is to actually **redesign** the work and not simply "rightsize" without changing "how" the work is done.

The magnitude of the changes required has highlighted the need to consider a wide range of strategies to accomplish this transformation. They range from creating a Shared Vision to Continuous Quality Improvement (CQI), Systems Thinking and Reengineering. The most critical success factor for any of these strategies -- the common thread -- is a transformation of existing management methods.

Achieving performance improvements requires a new <u>balance</u> between the traditional military "command and control" model and a new "inspire and shape with boundaries" approach that is required for designing quality into systems. The leadership at the Air Force Academy Hospital determined that this required "new metrics" for the very definition of leadership. They also believed that this exploration would uncover key leverage points for creating an organization equipped to compete for patients in an open choice environment. As Peter Senge notes, continuous learning may be an organization's only sustainable competitive advantage. This group is committed to just such a learning journey.

History - Identifying the Need for Change

At the same time healthcare organizations receive the "QAF Message," they suffer from increased directive oversight from authorities, more severe budget constraints, and increased external pressure to change the way business is done. Traditional assumptions about job security and long term benefits are shattered daily. Individuals are told to be empowered, and at the same time face open and implied risk for challenging traditional lines of authority. Dangers in such a system are often so great, that staff never overcome the fear of open communication, and thus doom organizations to continue to fail. These inconsistencies continue to occur at command, base and organizational levels. The requirement for change is acknowledged, but organizations are stymied in their efforts to accomplish meaningful or long lasting commitment to any new quality system.

Along with conflicting messages and actions, another barrier faced is the potential to establish the wrong focus. Indiscriminate use of evaluation tools often changes the primary focus of individuals in the organization from mission and process outcomes, to monitoring how the process is being done. This may not contribute to the organization or its customers and relates closely to the traditional military mindset — we are comfortable structuring (regulating) and inspecting (?QAFA) all that we do. Will there be value from this effort, or will it cause the untimely demise of yet another quality endeavor? The QAF message is already sometimes perceived as programmatic, and too limiting. There is potential merit to this argument.

Organizations should accept that there is no one generic Continuous Quality Management (CQM) formula which applies to everyone. What can be a tremendous success at one location can be a dismal failure at another.² Information generated through forums such as the AFQC should be used as guides but not limits to successful implementation of continuous quality. Senior leadership must be willing to accept that the changes implied in such an environment will require an openness which will actively reduce or eliminate risk. Effectiveness must be measured not in terms of compliance, but in terms of outcome impact. You can not mandate quality! There must be a willingness to evaluate and revise current processes. More importantly, we must look beyond mere tinkering, and ask basic questions about how or why we accomplish major tasks, and

sometimes risk radical change through actions such as "reengineering" and "reinvention."

"Walking The Talk"

Are the leadership messages and QAF applications consistent with the implementation of true quality improvement implementation? People have a tendency to operate within known rules and boundaries. When crises arise, we revert to behavior patterns which were successful in the past. This is normal behavior. A pretext of Quality Improvement, is that to be truly successful in an organization, we must work towards establishing a "Quality Culture." This is no overnight proposition. The example of executive management behavior lends credence to this fact. Simply because one supports an idea, it does not mean behavior patterns will change overnight. During these early phases of QAF integration, we have witnessed many examples of success and failure. The trick is recognizing when each occurs, and learning organizationally from the experience. Through recognition and learning we can hope to modify our patterns of behavior, and continuously improve our application of principles of continuous improvement.

Because Air Force has supported the principles of Quality Management, we see some levels of compliance and training from many locations. This alone does not indicate success. Successful implementation implies that the most senior organization members will take an active role in the introduction of their staff to quality management philosophies. Leaders who are most effective will demonstrate quality management by example. There are many examples of "quality casualties" in business literature. These are organizations in which quality management theory was deployed from bottom or mid-level out. CEOs may have said they supported the initiative, but did not take an active role. When there is no senior recognition or action, initiatives are almost certainly doomed to failure. Successful leaders will move organizations from compliance to commitment through visible and meaningful involvement in the quality evolution. This process may take several years before one can describe their organization as possessing a quality culture.

Realizing that health care crisis loomed for both the civilian and military sectors, the Academy hospital embarked on a process to successfully cope with its environment. Escalating costs, increased liability, technological expansion, changes to both client and provider populations, as well as a host of other influences all pointed to the need to adapt. Because change was required, it did not follow that all change was good. Leadership realized that the price of change without perceived purpose, too rapidly deployed, not fact-based, or based upon political rather than practical concerns, can result in rework, waste of resources, and dissatisfaction (both for internal and external customers). Thomas Berry notes that establishing an effective TQM process and culture, requires significant preparation and resource to do it well and with lasting effect.³ Below is a synopsis of the beginnings of our transformation. Although CQI, TQM, QAF or some other flavor of management may not be the final answer to quality management in the future, clearly some form of information-based decision making to ensure internal and external customer satisfaction will be around for some time -- at least in successful organizations.

The Journey

During the late 1980s and early 1990s the Joint Commission for the Accreditation of Healthcare

Organizations (JCAHO) orchestrated "an agenda for change" that challenged how healthcare settings measured organizational performance and quality. In the last two years, this focus has evolved toward a full embracing of the continuous quality improvement philosophy. As our leadership witnessed these developments, this leveraged the USAF Academy Hospital to change. In 1991, the hospital Quality Assurance Office started the USAF Academy Hospital on it's "Quality Journey." Senior leaders were exposed to key concepts and principles, and training was pursued from a variety of civilian and military quality experts.

In December 1991, the Hospital Executive Committee fielded its first process action team, and over the course of the next year, several others quickly followed. Training for teams was inconsistent. There was no formal chartering process, other than acknowledgment by the senior leaders. Team leaders and facilitators varied greatly in their experience and training. To the credit of the Quality Assurance Officer, the Hospital Corporation of America "FOCUS-PDCA" model was provided as a "road map" for team activities. These early times were an exceptional training ground for developing problem solving skills, and resulted in many measurable quality outcomes as a result of team application.

In October 1991, the USAF Academy started to develop a Quality Management office for the wing. From January through March 1992, meetings were conducted with executive staff and the new Quality Office staff, to develop a plan for Quality Improvement. Efforts included training; creation of mission, vision, core values; and identification of desired future outcomes.

In April and May of 1992, the Hospital Quality Assurance office planned and formulated introductory awareness training. This training had the full support of executive management. The stated goal was to provide the <u>opportunity</u> to train 100% of hospital staff in basic continuous quality awareness by August 1992. The need for training was motivated externally by 1992 JCAHO Standards, which required that "Leaders undertake education concerning the approach and methods of continuous quality improvement." Internally it was driven by an announcement by the Superintendent of the Academy that all academy staff should have introductory level training by Cadet graduation (e.g., within six months). We willingly "stood up to salute."

Our class was designed to meet the above stated needs, using in-house resources. A cross functional core of volunteers were trained in aspects of continuous quality. Trainees were in turn used to train other staff. The Wing Quality Management Office provided support with training aids and materials. Curriculum and training manuals were developed in-house. Several non-traditional approaches were instituted to enhance these sessions. First, training was accomplished away from the hospital. Second, attending staff and faculty were not allowed to wear uniforms or to use rank. Third, pseudo names were used for the entire day, so that a stated non-attribution rule would be even more likely to succeed. Finally, senior leadership (the commander) participated in every session, to personally voice his commitment to what was being taught. Our training balanced lectures, video's, group exercises and humor to foster adult learning. Continuing education credit was obtained for both physicians and nurses as an additional incentive for training. The result was one day seminar specifically geared to meet the hospital's needs.

On 2 June 1992, the first class was conducted, and over the next three months, 96% of active

duty staff were trained. Attendee response was enthusiastic, and the curriculum was refined using class feedback and monitoring. During the course of this initial training, the hospital's first challenge to it's commitment to quality management was realized. It was at this time that the key catalyst (the Quality Assurance Coordinator) moved into a new role, and another person assumed oversight of the quality management initiative

In August of 1992, I (Maj Smith) arrived at the Academy Hospital. Upon entering this position, the office was renamed to "Quality Management Services," to reflect that the scope of oversight had shifted to include both traditional hospital quality assurance and quality improvement initiatives. Informal organizational assessment identified the following positive aspects:

- The senior leaders were motivated to embrace the principles of continuous quality.
- There was 'grass root' commitment from staff, and a positive attitude involving the training that was underway.
- The training strategy was effective and well received at every level.
- There was a small but energized and committed core of trainers.

Negative concerns were:

- Process action teams were essentially "working in the dark," few were well known, and those with notoriety were the ones with known problems.
- There was no central mechanism established for oversight of organizational quality issues.
- The hospital had no common vision or methodology in its quality approach.
- Terminology meant different things to different people.

The Action Plan

Senior leaders were approached and accepted the concept of establishing a Quality Council (QC). Just 50 miles south of the Academy is Parkview Hospital, a small medical facility with an established reputation as a leader in continuous improvement application in healthcare. The examples they showed provided a tangible target for our leadership, and greatly impacted the willingness to establish our hospital Quality Council.

Our first 'QC' meeting was conducted 2 September 1992. The QC was composed of key process owners for the facility and reflected the membership of the Hospital Executive Committee. Activities such as monitoring of ongoing PATs and training of staff were shifted to this new forum. The first few meetings were primarily used to establish a common frame of reference for the members: terms were explained, ground-rules established, membership and meeting frequency defined, etc. Next was a critical review of actions that had been conducted to date. The group worked to identify some existing organizational barriers, and to define their perceived goals.

In October of 1992, the Council met in a two and one half day off-site training and work session. This was preceded by a unit self-assessment survey to measure readiness for change, assessment of the Quality Council's ability to work as a team, individual team member personality analysis, and an internal assessment of critical tasks and outcomes. Senior officers from the wing

facilitated, greatly reducing any potential rank related barriers to effective team action. Using quality management tools, the team initiated the visioning process. Over the next few months they met regularly to define a common mission, core values and key organizational outcomes.

While the QC was refining its processes, the Quality Management Office attempted to recapture the process action teams. Teams were held to more accountable reporting. Those teams which appeared to be 'floundering' were provided trained facilitators and education to guide action. As teams reported, senior leaders showcased their efforts to the hospital. Presentations of PATs were conducted in applicable duty sections, during commander's calls, and at executive staff meetings.

By December of 1992, the QC had established a formal mechanism for chartering PATs, and for soliciting suggestions for improvements from the workers (The 'Direct Line' program). Formal PAT chartering allowed preservation of limited assets (facilitators and time), and focused teams on processes and issues with organizational or customer impact. The Direct Line initiative provided a risk free forum for any worker to identify process barriers, and to make suggestions to eliminate or moderate barriers and improve the flow of work. The QC embraced the concept of "Championship". For various key outcomes and processes associated with the hospital, specific QC members served as the focal points for action or barrier moderation. Champions also act as liaisons between process action teams, and the QC.

Over the course of 1993, seven process action teams evolved, to find and address root causes for key processes. During the same time frame, there were 21 Direct Line referrals to the QC, each identifying opportunities to improve service or performance. Additionally, there were many "Tiger Teams" (e.g., work center related teams) established which systematically tackled long standing concerns.

Lest one have the misconception that all the stated gains were without pain, there were several learning opportunities experienced at every organizational level. Some teams and facilitators continued to falter. At times, there was not frequent enough oversight and team management. There was significant learning on the part of the QC before its members clearly understood the role of champion. Additionally, efforts on the part of Air Force, the Wing, and the hospital have not been a close match philosophically. Despite the hospital's acknowledged position as a local leader in the application of continuous quality principles, there has been predictable conflict over how we are pursuing our application model.

In the fall of 1993, the executive team again recessed for an off-site retreat. The goal was to learn about, and establish, meaningful 'metrics' for our organization. Environmental drivers were current literature, JCAHO accreditation, and the Academy senior leadership. During this session, a civilian consultant was hired. The consultant had a background in statistics and industrial quality improvement. His experience did not translate well into our service environment. We did, however, get a taste for the true complexity of the task we were undertaking. We conducted an assessment of available training opportunities, and accomplished advanced metrics training for one of our staff through a reserve unit. Our new local expert undertook focused training of staff, and started some initial metrics development. The examples generated were in turn used to train

our executive team. The QC is now meeting weekly to identify and develop key measurement systems to assess organizational quality outcomes, and to drive critical business decisions.

One of this years initiatives, is to increase the scope and visibility of quality improvement activities. The QC has opened Council meetings to the entire hospital staff; and Quality Management has posted team story boards prominently in the hospital's main patient lounge. A civilian representative has been added to the Quality Council, and the QC is pursuing improved public relations through the use of our Patient Relations Council.

The issues of meaningful metrics and strategic planning are critical. Our hospital has been involved with coordinating care in our military healthcare community (Fitzsimons Army Medical Center, Evans Army Community Hospital and Peterson Air Force Base Clinic). Refining processes and reducing duplication has allowed each organization to better use common resources. New initiatives under DoD Tricare require unprecedented change for military healthcare. For the first time, we will directly compete with civilian markets for a significant share of our client base. Implications are enormous -- failure to respond in an effective or timely fashion could cause irreparable denigration to the scope of care and service we currently offer.

Given this need, the QC had to make a decision regarding reassessment of our current status along its "quality journey." Despite this desire for realistic self-appraisal of current philosophy, design and application, Academy Hospital leadership was cognizant of the fact that we were still early in our quest to establish a continuous quality environment. We did not and do not want to fall into the trap of trying to comply with a "programmed approach." Our primary goal was related to our defined mission, "To provide continuously improving health care services for the community we serve."-- not towards achievement of an external criterion set or competition (such as the Deming or Malcom Baldrige Awards). Our answer was to seek true external assessment through a Quality Consultant. In addition to this "gut check," our desire was to establish an ongoing relationship. There are several anticipated benefits. First, an external pair of eyes can ensure that we do not become 'inbred' in our approach or methodology. Second, because the consultant is not living with our problems, we have an avenue of unbiased assessment. Third, a consultant does not have to worry about rank structure, promotion or politics -- observations and interventions are more likely untainted. Finally, an ongoing consultant can provide continuity and history for our military organization. Given the importance of such a role, this is no time for quick decisions or low-ball bidding for service! In meeting this dilemma, the Air Force Academy Hospital decided to hire a local consultant. Selection involved both an extensive search and personal interviews, to insure that there was a "philosophical match" with our organization.

Generating "Creative Tension"

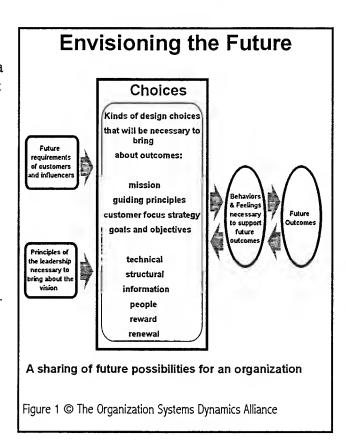
Peter Senge introduced the concept of creative tension -- the stretch created by the gap between a "shared vision" and an organization's "current reality" ⁵. The challenge is to create a shared vision within an organization that inspires employees to participate in the vision's ongoing implementation. Senge believes that employees will sign up for the challenge without hesitation, if given the opportunity. This is based on his reasoning that employees are naturally motivated to work toward a higher purpose -- beyond personal considerations. This is certainly true for the

majority of employees in military health care. Unfortunately, barriers to serving that higher purpose are often prevalent in the daily work environment. As a result, it is essential to obtain a greater understanding of the current reality. This task is often more difficult than establishing a shared vision. For example, it is clear to most health care staff that a vision must include development of a seamless continuum of care for a given population. However, their view of current reality depends on their own unique experiences and their position within the organization. Everyone is by definition limited to their own "point of view."

This initial appraisal was accomplished by obtaining opinions from a vertical slice within the organization. The "Snapshot" Assessment was a source for generating creative tension. It provided the Quality Council with common themes related to a potential shared vision as well as insights into the struggles staff experience in their daily work life -- the barriers that keep them from providing quality service and utilizing their creative talents. Exploration of this information resulted in a greater understanding of the organization as a whole. It identified key leverage points for moving the organization forward on its journey toward competitive positioning.

Conducting the Snapshot Assessment

The framework for the assessment was built around a model developed by the OSD Alliance (Figure 1). It reflects their work in designing High Performance Organizations. The model makes explicit the cause and effect relationships that drive organizational performance. The Environment combines with the Principles of the Leadership to influence Organizational Design Choices. The Organizational Choices include Mission, Guiding Principles, Customer Focus Strategy, and Goals and Objectives. These Organizational Guidelines form the basis for aligning the Organization's systems (technical, structural, information, people, reward, and renewal). All of the Design Choices then impact Behaviors and Feelings, which in turn drive Performance Outcomes. As the Air Force Academy Hospital learns the model and understands its implications for performance, the hospital will be on the road to becoming a selfdesigning organization. Ultimately, this process can be conducted without the use of external consultants.



Identifying Key leverage Points

Key Leverage Points are defined as areas with high potential for changing the dynamics in an environment. Just as a lever can be used to translate a small amount of energy into a tremendous force for moving an object, so can certain management actions translate into a major force for positive change. While the points identified in the Snapshot were specific to the Air Force Academy Hospital, they would also be relevant to any military or health care organization

attempting such a radical transformation. Key leverage points included:

- 1) Focus the organization on the key organizational outcomes (metrics) as defined in the vision. Be relentless on removing the barriers that stand in their way (remain clear and not overly optimistic about current reality).
- 2) Determine which systems simply need improvement and which need to be totally reengineered. Provide clear charters and adequate resources to groups working on both approaches. Coordinate improvement efforts so that individual processes are not optimized at the expense of the entire system.
- 3) Increase vertical linkages between senior management, middle management, and front line workers. These linkages involve visibility, the flow of information and clarity of expectations. Also, work to establish horizontal linkages to break down the "stovepipes" between areas of the hospital. As Margaret Wheatley notes, building relationships is critical to fostering success in any organization. The creation of new relationships is also highly connected to developing new flows of information that generate new synergy's and possibilities. The key is channeling these efforts toward the Shared Vision. To be most effective, efforts should be focused like a laser beam, not a shotgun.
- 4) Design a new scorecard for managers and staff. Define the management behaviors required in the expanded roles of lawgiver/boundary setter, mentor, coach and champion. Define the staff behaviors appropriate for participating in improvement or redesign efforts.
- 5) Clarify the ground rules for risk-taking. Not all risks are created equal, and in some circumstances, the "command and control" model is the most appropriate. Also detail the appropriate etiquette for pointing out variances between the vision and current reality. In other words, when leaders do not "walk the talk" how can they be coached? Provide both incentives and a safety net for all participants that are directly linked to the performance review system.
- 6) Invent ways for everyone to include quality improvement as an aspect of their daily work. This involves providing simple tools and clear avenues for applying the tools.
- 7) Encourage patience and understanding at all levels of the organization. Maintain a pioneering spirit for learning, and celebrate milestones as they are achieved!

Metrics of Health Care Leadership

Michael Hammer and James Champy provide a framework for contemplating metrics for the art of managing in the new way. First, they discuss a leader's responsibility for sending clear and compelling signals. Signals refer to the formal and informal messages communicated by management. Reducing mixed messages and variation among managers is a prerequisite for clarity and focusing the organization. Next, leaders must master the art of sending powerful symbols. Leaders have long recognized the significance of symbolic behavior. In any age, actions speak louder than words. Managers must ensure that their "video matches their audio." Words

alone will not create a transformation. Lastly, leaders must attend to the **systems** that only senior management can tackle. Management demonstrates its commitment and produces key business results by reinventing the systems "they" own. Examples include planning, budgeting, information systems, performance review, training and education. Once again, all of these design choices in systems must be aligned with the new vision.

Criteria for evaluating how effective the management team is with these tasks could include communication effectiveness (accuracy and timeliness), employee feelings of ownership or involvement, turn-around time in responding to employees and improving systems, and business outcomes achieved in improving systems.

Conclusion

According to the old adage, "the best way to know the future is to create it." While no one can predict all the future's challenges, one key to success is becoming quite clear. Successful organizations will apply new technologies that create an environment in which all persons can "Fly High." They will possess a sense of purpose that lifts the spirits of their employees and challenges them to acts of courage in pursuit of a shared vision. Military and health care organizations have an advantage in making this transition because of the nature of their work force. Military personnel are motivated to serve the needs of their country. Health care workers are motivated to improve the health of others. By involving them in creating and moving toward a shared vision, a whole new reservoir of talent and creativity is tapped. This reservoir will make it possible to survive and even thrive in the year 2000.

Works Cited

- ¹ AF Pamphlet 50-34. Promotion Fitness Examination Study Guide. Department of the Air Force, 1992.
- David Sirota, Brian Usilaner and Michelle S. Weber. <u>Breaking Through the Culture Wall</u>. Journal for Quality and Participation, March 1994
- Berry, Thomas H. <u>Managing the Total Quality Transformation</u>. New York: McGraw Hill/ASQC Quality Press, 1991.
- ⁴ Hospital Corporation of America, Quality Resource Group, Nashville Tenn, 1992.
- Senge, Peter M. The Fifth Discipline: The Art & Practice of The Learning Organization. New York: Doubleday, 1990.
- Wheatley, Margaret J. <u>Leadership and the New Science: Learning about Organization from an Orderly Universe</u>. San Francisco: Berrett-Koehler Publishers, Inc., 1993.
- ⁷ Zuckerman, Marilyn R. and Hatala, Lewis J. <u>Incredibly American: Releasing the Heart of Quality</u>. Milwaukee: ASQC Quality Press, 1992.
- 8 Hammer, Michael and Champy James. <u>Reengineering the Corporation</u>: A Manifesto For Business Revolution. New York: Harper Collins Publishers, Inc., 1993.

Designing Service Processes for Customer Satisfaction



Kateri T. Brunell

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Ms. Brunell holds a B.A. degree from the University of South Florida and an MBA from Florida Atlantic University. She is a member of the American Society for Quality Control and is also an active explorer on the Internet.

DESIGNING SERVICE PROCESSES FOR CUSTOMER SATISFACTION

Kateri T. Brunell Consultant Qualtec Quality Services, Inc.

Abstract

Government organizations today have heard the clarion call for change since the release of the National Performance Review report late last year. This report entitled <u>From Red Tape to Results: Creating a Government That Works Better and Costs Less</u> calls for putting customers first, reducing red tape and costs by streamlining operations while maintaining or improving quality of service, and empowering employees to get results. And unlike most of its counterparts in private industry, government must reinvent itself under the gimlet eye of public opinion.

This paper takes a position that agrees with one of the basic premises of the National Performance Review report: that breakthrough levels of improvement in quality, customer satisfaction and cost reduction can be obtained by designing or redesigning service processes.

This endeavor should begin and end with the Voice of the Customer. Once the customer requirements have been gathered, design teams can use Quality Function Deployment (QFD) and its related tools to translate the customers' voice into actionable design priorities and the associated delivery system.

The paper presents and describes a model for Quality Function Deployment that has been implemented in several service organizations with good results. How it would work in a military setting is also discussed.

The Military in the 1990's and Beyond

The US. military has a unique challenge in fulfilling its role in the reinvention of government. It must remain customer-focused while reducing staff, as well as continue to achieve its mission of securing the national defense.

While a number of governmental agencies embarked on the Total Quality journey during the 1980's, they have mainly implemented tools and processes that achieve continuous, incremental improvement rather than breakthrough gains.

Continuous improvement--or kaizen-- methods, such as process management and problem solving teams, are important. By using them, organizations may search out and destroy inadequacies in the existing processes and lock in the gains achieved.

But what if the problem is that there is no process? What if an organization's existing process is so incapable that it needs to be redesigned?

Quality Function Deployment (QFD) is a Total Quality Management methodology that focuses on integrating the customers' needs into the way an organization plans, designs, produces and delivers products or services. Developed in Japan in the early 1970's, it first proved useful in the Kobe shipyards where the development cycle for oceangoing vessels is long, and design changes made late in the process are disruptive and costly. Since then, QFD has been used in a wide range of manufacturing settings--from automobiles to electronics. More recently, QFD has been successfully applied to a number of services, albeit with some modifications.

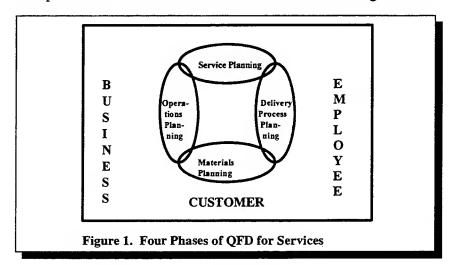
Like other TQM methods, QFD is a team-based approach. The teams are cross-functional task teams, and membership includes all departments and functions that will be affected by the new service process. Unlike other TQM methods, however, it is design-oriented. The objective is to prevent problems from occurring through concurrently planning and designing the process or system based on the customers' requirements, competitive factors, and organizational constraints. It requires organizations to be looking ahead and anticipating what will be important, rather than reacting to problems as they happen.

The Quality Function Deployment Model for Services

As it is described in this paper, QFD is a systems approach to designing services from end-to-end. It involves building into the process a mechanism for self-correction so that the process remains responsive to customer needs and able to adapt accordingly. The QFD model is divided into four phases, each with specific inputs, activities, and outcomes. (See Figure 1.)

- Service Planning
- Delivery Process Planning
- Materials Planning
- Operations Planning

These phases are described in more detail in the following sections.



Service Planning

One of the first tasks of QFD is to collect customer data. In government, there is usually a multiplicity of "customers", so these stakeholders have to be identified and prioritized. For example, a military organization may determine that its "customers" include the fighting personnel, the military leadership, Congress, and/or the taxpaying public.

After the customers are identified and prioritized, their requirements have to be determined. Through focus groups, interviews and other qualitative research techniques, the QFD team should compile an exhaustive list of needs and wants stated in the customers' own words. These items are then clarified and combined using a tool such as the affinity diagram. Then the requirements are evaluated with quantitative research. In other words, the customer verbatims are used to construct a questionnaire that is sent back out to the customers so they may verify the relative importance of each requirement.

Also if it is possible, customers are asked to rate the agency's performance on each requirement relative to a set of competitors. (Competitors in a military setting may be different offices, bases, or departments that perform the same function. Or in some cases, it may be a civilian organization that provides the same type of service).

During this phase, the QFD team uses the "House of Quality", a series of matrices and charts, to organize the customer, competitive, and operational data.

Once the customer data is compiled and placed on the House of Quality, the QFD team uses a structure tree (systematic diagram) or other tool to generate design requirements. These are the activities or elements the organization must do to meet the customers' needs. Design requirements should be controllable, measurable, and observable.

In the next step of building the House of Quality, the design requirements are related to the customer requirements in a matrix. The degree of impact each design requirement has on meeting each customer requirement is noted by the team (strong, medium or weak). By assessing the relative impact of each relationship and analyzing it with the importance factor for each customer requirement, the team can compute the technical importance of the design requirements. This helps the team establish priorities among the design requirements.

Also, the team assesses any negative or positive correlations among the design requirements in the "roof" of the House of Quality. This analysis allows them to predict which design requirements may have a negative effect on another, or which may create synergies.

In addition, the team will conduct an assessment of the organization's performance on each design requirement relative to the competition--similar to the customer competitive assessment mentioned earlier.

To complete the House of Quality, the team also brainstorms limiting factors--those elements outside of the organization's control which will act as a constraint on implementing any design requirements. (See Figure 2. for an illustration of the House of Quality format).

They interpret the House of Quality, examining each "room" by itself and in concert with the others. More specifically, they look for:

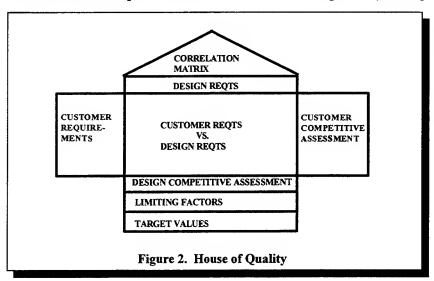
- Sales points--customer requirements in which the organization is outperforming the competitors
- Improvement points--customer requirements in which the organization is performing less than the competition
- Leapfrog opportunities--important customer requirements in which the organization and the competitors are performing at a low level
- Tradeoffs and enhancement opportunities--design requirements that are correlated (as noted on the Roof) and that impact strongly on important customer requirements

From this interpretation, the team is able to select the key design requirements to carry forward into the next phase. Before moving on, they set target values for performance on each key design requirement.

Delivery System Planning

Once the key design requirements have been identified, they are organized and integrated into a cohesive delivery system. The team starts by examining or anticipating the customer moments of truth--those points at which the customer interacts with either an employees, physical resource, or system of the organization.

Everything the customer does to complete one cycle of service is mapped on this service blueprint. The front-line activities the organization engages in to meet the customers' needs at every point are also mapped. Then the supporting activities the firm engages in to meet the needs of the front-line service providers are drawn on the blueprint. (See Figure 3.) In this



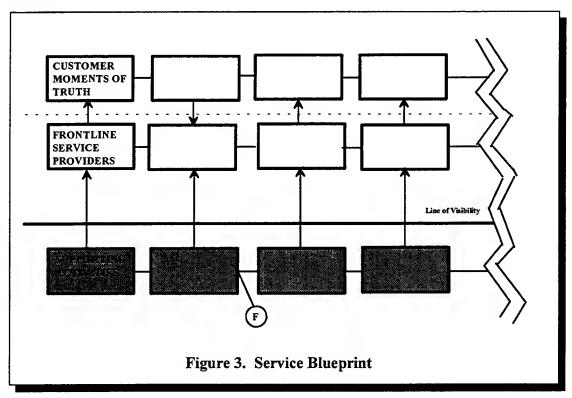
manner, the set of interrelationships needed to meet customer needs are documented and verified. The team also notes failpoints, those points in the service system where a breakdown, bottleneck, or other problem may occur. (In the case of a new service process, the team would have to anticipate the failpoints. In redesigning an existing service, the team can use data to determine the location of failpoints.)

The team can build reliability into the system by examining each failpoint in detail and applying reliability techniques, such as error modes and effects analysis (EMEA). Through EMEA, quality is built into the service design, because service delivery problems are anticipated and "designed out" before they occur. The errors associated with each failpoint are prioritized according to their criticality, and then foolproofing techniques are applied to either prevent the error from occurring or to contain its effects if it is not entirely avoidable.

The outcome of Phase II should be a draft service blueprint and an analysis of the high-priority failpoints (with alternatives for preventing or mitigating the errors).

Materials Planning

At this point, the team has mapped out the service delivery system and built reliability into it. Before they can implement the service, they must determine the optimal mix of resources required. To do this, the QFD team uses the service blueprint as a prompt to generate a list of physical and human resources needed for different design alternatives. The team may brainstorm the materials, equipment, systems and people needed and compare the cost and time factors involved for each alternative. They also relate the alternatives back to how well they satisfy the key design requirements.

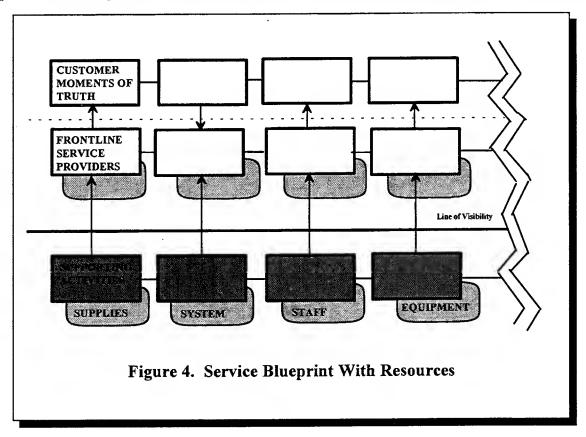


The outcome of Phase III is a finalized blueprint and a list of resource with their specifications and costs. (See Figure 4.)

Operations Planning

In the final phase, all requirements generated by the new service design are aligned with the organization's existing support processes. For example, if the new service will require the periodic purchase of certain supplied on an ongoing basis or the hiring and training of certain types of personnel, these needs are linked to the purchasing and human resources functions.

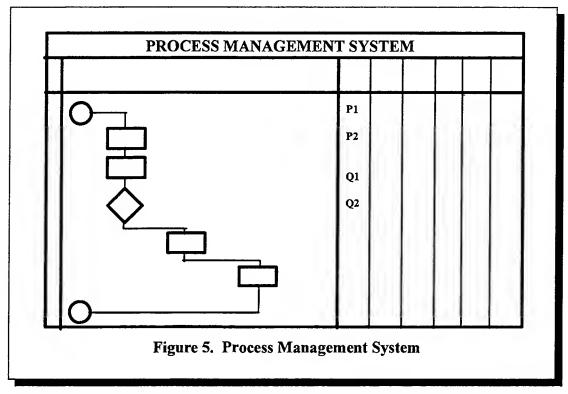
In addition, the processes for continuously improving the design are planned and put into place in this last phase. Those departments or individuals responsible for monitoring customer



satisfaction with the service are identified and assigned accountabilities. Likewise, a process management control system may be built around key processes (based on design requirements) so that performance to target values identified on the House of Quality can be maintained and continuously improved. (See Figure 5.)

Summary

- QFD systematically integrates the needs and wishes of the customer into the new service development or re-engineering processes
- QFD enables organizations to minimize the risk associated with bringing new services on



- line, because every necessary activity is anticipated and linked to customer needs
- QFD provides a structure for cross-functional communication and coordination during service planning and implementation
- QFD reduces service development cycle times
- QFD provides a framework for service improvement and management
- QFD embodies the four principles of TQM: customer satisfaction, management by fact, continuous improvement and respect for people QFD lays the groundwork or supports further improvements through TQM processes, such as Policy Management, Process Management and problem-solving

Developing and Conducting Customer Satisfaction Surveys



Maj Paul Adams Willard II



Mr. James Geiselhart

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His team is responsible for conducting analysis of contracting processes to identify inefficiencies, value-added metrics, and benchmarking opportunities.

Mr. Geiselhart began his career as a contract specialist for the Defense Logistics Agency. From there he transferred to Aeronautical Systems Center (ASC), WPAFB. There he has served as Contracting Officer/Division Chief on such programs as B-1, F-16, TR-1, and various simulator and reconnaissance system programs. In addition, he spent two years at the Joint Cruise Missile Program Office in Washington D.C. Mr. Geiselhart has a BS and MBA from the University of Dayton.

Developing and Conducting Customer Satisfaction Surveys

Maj Paul Adams Willard II, USAF Mr. James Geiselhart Aeronautical Systems Center

"...organizations that know their customers, understand their needs, maintain appropriate contact, deliver high quality, listen to customer feedback, and adjust to meet changing customer requirements, consistently succeed at accomplishing the mission." - QAF 7.0

ABSTRACT

One of the key tools used in measuring the satisfaction of customers is the customer satisfaction survey. Organizations at all levels are creating and conducting surveys to determine if they are providing the customer with the goods and/or services they need in an acceptable manner.

Most organizations do not have sufficient survey experience and few have the resources to employ professionals to develop and conduct surveys for them. This paper will provide a layman's approach on how to develop an effective customer survey for an organization. It will give specifics on what to ask and how to ask in order to obtain honest performance feedback.

The paper will also detail the problems and pitfalls of surveys; discuss frequency and length; and include basic mechanics to avoid possible legal conflicts. Suggested survey formats, and a list of organizations and materials that can help build an effective product will also be included.

The conclusion will discuss how to develop action plans to address survey issues and problems.

WHY SURVEY

Conducting surveys is not a new event in the United States or the Air Force. Most people tend to think we are "surveying to death." The reality is that surveys are still an area under development in the United States. According to the Quality Assurance Institute in Orlando Florida, "only half of the Fortune 500 companies have attempted an internal customer survey, and the percentage is far lower among smaller firms"1.

Customer satisfaction is an unplowed field in the United States. James Taylor, National director of marketing for Ernst and Young, reports that just 22 percent of U.S. firms report real customer expectation data in process design. This compares to 58 percent of Japanese firms and 40 percent of German firms.².

What is happening in the U.S. and the military is the move toward a quality culture. Included in this move is the emphasis upon customer satisfaction. Customer satisfaction is a key factor of the Quality Air Force (QAF) criteria. The Quality Air Force criteria is basically a "Blued" version of the Malcolm Baldrige criteria which is currently used to measure quality in industry. The QAF criteria will be utilized by military

organizations for conducting a Unit Self Assessment.

In examining the Quality Air Force Program there are at least three areas of QAF which lend themselves to surveys: item 4.5, Organization Member Well-Being and Satisfaction; category 5.0, Management of Process Quality; and category 7.0, Customer Focus and Satisfaction.

While surveys will help in providing answers to the QAF criteria, they should not become a quick fix to a self assessment requirement. Surveys have, and will continue to be a valuable tool for decision making. They are a critical means to obtain information that is unavailable from other sources or would be more difficult and expensive to obtain otherwise. In our application of customer satisfaction, we will emphasize our ability to create or modify a product or service. This paper will walk you through a simple process of survey development that can be applied at any organizational level.

SURVEY DEVELOPMENT

Before you take off on your quest to develop a survey you need to stop and make a few, but critical decisions.

The first thing you need to decide is "what is your purpose or objective?" Our assumption is that you want to identify from your customers' point of view if the product or service is meeting their expectations. Some questions which you should ask are:

- is the problem or requirement well stated
- does the surveyor understand what the problem is or the question he is trying to answer
- is the problem or question real
- does information already exist to

- answer the question
- can we afford to do a survey
- do we have the time, resources, and materials to complete a survey
- will the survey produce the best data with minimal inconvenience to the respondents
- what is my educated guess or hypothesis to answer the question.

Once you have answered these questions then you are ready to move on in surveying.

SURVEY METHODS

There are basically three types of surveys. A complete survey of everyone in a group is a "census." A census should be used when it is vital to know the feelings of everyone in a survey group or the group is small or focused. While a complete survey is not practical with a large group, it has the lowest "risk" or "error bias" in that you obtain feedback from everyone.

The second and most common type of survey is the random sample. This is used when you have a large group and want to develop inferential statistics which can be applied to the entire population. In using random sample you must ensure that your sample group is unbiased and representative of the total population, we will explain ways to do this in the paper. The third type is the "volunteer" survey. This technique is often used with feedback forms, exit polls, comment cards, etc. While this is considered the least scientific in providing information for decisions it can be used to identify immediate problems or successes.

SURVEY PLAN

If you have passed the test of whether or not to survey and know which method you want to use, the next step is to develop a survey plan. The plan involves three major steps:

- (1) Data Collection
- (2) Data Reduction
- (3) Data Analysis

The survey should address each one of these as a part of the whole. The main purpose is to collect only the data you need to answer your question. Try to focus on three to five specific performance issues with 20-40 questions. Decide if you want to do interviews, telephone queries, or questionnaires. If you are requesting a great deal of data you will need Automated Data Processing (ADP) support. Coordinate with your ADP people far in advance to see what they can or can not do to meet your schedule. If you use ADP you must use "closed-ended" multiple choice questions which do not allow for write-in comments. If you use "open-ended" or write-in comments, you will spend a great deal of time manually analyzing the data.

In the analysis plan you should discuss how you will interpret the data. The following questions need to be asked:

- Did I receive information from the right person
- Did they give me the best information they could
- Did my questions get the information I need
- How will I handle non-responses.

QUESTIONNAIRE

In conducting a survey the questionnaire is the best bet. It requires the lowest investment of time and money, allows for standardization and anonymity of the respondent, and can be administered to large groups of people. Many researchers also believe respondents are more honest with a written questionnaire than an interview.

The problem with the questionnaire is in non-responses. If you have a small participation rate, you must be careful in handling the data. Also you must determine what significance, if any, is given to non-responses.

Another problem with questionnaires is misinterpretation. This happens when the respondent does not understand your instruction or question. To combat this situation, use plain language in your instructions and questions. Another method is to involve a cross representative group from your survey group to help in developing the questions and instructions. After you have developed your proposed questionnaire; administer it to a small representative test group. Explain that you want them to take the survey and then critique it and the instructions afterwards. This will allow you to fine tune the document to help eliminate misinterpretation.

A final problem with the survey is, determining if the respondent gave you an honest, valid answer. This is difficult to determine but a well constructed survey should minimize this problem.

SURVEY CONTENT

The survey should consist of three documents:

- (1) The cover letter
- (2) The instructions
- (3) The questionnaire

The cover letter should explain why the survey is important, not only to the organization, but the respondent also. It should explain how participants were chosen, how the data will be used, and how

anonymity will be protected. A higher level of sponsorship of the cover letter is often commensurate with an increased response rate.

The instructions should follow your cover letter and clearly tell the respondent what to do to complete the survey and how to return it. Remember to protect the respondents anonymity. If you use some form of control numbers on the survey, you must clearly state that they will not be used to identify the data back to an individual. The same applies to the use of names and social security numbers (SSAN's). Also, if names and SSAN's are used for tracking purposes you must include a privacy act statement. The instruction page would also be a good place to put a point of contact for anyone with questions. We also suggest offering the respondents the opportunity to request a copy of the survey report upon completion.

The third part of the survey is the questionnaire. Minimizing the number of questions often enhances the rate of return. Keep it to only the information you really need. Try to keep the questions short and use simple language. Limit questions to one idea or concept. Do not ask leading questions and avoid subjective terms such as good, fair, bad, etc., also avoid emotionally charged questions; understand that respondents tend to answer "should" questions from a moral viewpoint and "would" questions from a personal viewpoint. If you need demographic information on age, sex, grade, group, etc., place these questions together and include them at the beginning or end of your survey.

Your data questions should be multiple choice or close-ended. We would recommend using the Lickert scale. This scale allows the respondent to choose from

one of several degrees of feeling about a statement from strong disapproval to strong approval. The answers are given scores or weights ranging from low to high with the highest being the most favorable attitude about the question. Some possible scales are:

- (1) Strongly Disagree
- (2) Disagree
- (3) Undecided
- (4) Agree
- (5) Strongly Agree
- (6) N/A or Not Applicable

Oľ

- (1) Very Dissatisfied
- (2) Dissatisfied
- (3) Somewhat Dissatisfied
- (4) Somewhat Satisfied
- (5) Satisfied
- (6) Very Satisfied
- (7) N/A or Not Applicable

Whichever you decide to use, determine the value and the separation of the levels before you survey. Be sure to include a "Not Applicable" response. This will preclude someone from scoring a level when it really does not apply to them.

THE SAMPLE

The keys to a good sample are insuring the size is sufficient, representative, and unbiased of the entire population. While getting all three of these qualities may be tough, the best method is through the random sample. The random sample has proven to be the most reliable way to reduce sample error from any one of the three keys. The random sample basically is built around the concept that every member of the population has an equal opportunity of being solicited for the

survey and the selection of one member of the population will have no influence on selection of any other member.

The best tool to use in random sampling is a random number table. A computer can do this for you or you may assign numbers using a table, SSAN, telephone numbers, etc. We would highly recommend using a computer. You may want to use a stratified random sample which divides your population into groups such as civilian and military, officers and enlisted, etc. If so, include this information in your survey plan and questions in order to be able to identify the groups. If you do use a stratified sample you must ensure that the survey is proportionally distributed among sizes of groups which are representative of your population.

Some organizations like to use comment cards, or ask every tenth customer what they think of the service. This is systematic sampling and at best will tell you of incidents. While it is a good technique to identify problems in a quick manner, remember that this method is non-random and limited in its ability to tell you how well you are serving your customer. For example, the base hospital pharmacy may report a high satisfaction rate from their customers; but you must recognize this only reflects the ones who use the pharmacy. Those who elect to use a private source are never polled on why they are not using the pharmacy.

Your next step is to determine your risk or confidence factor and sample size. Most researchers use a 95% confidence level and a \pm 5% precision level. The bigger the sample, the better your data and lower the error. We have attached information to help you with this in an appendix.

FOLLOW UP

Never conduct a survey without an action plan on what you are going to do with the data you receive. "Management can survey their employees to assess working conditions out of curiosity or to relieve their anxieties about everything being "all right". However, surveys raise expectations by those who take them, and those they tell. When expectations of change remain unfulfilled, employees can become more demoralized than before the survey."3

This area is where people have the biggest problem with surveys, that is they never hear anything after the survey. Leadership must take the results in the form of an action plan back to the people. If not, surveys will become meaningless. We must also allow time between surveys for people to see results of previous surveys. Ensure that the frequency of surveying allows for action before measuring again. It's best if surveys can be administered on a regular schedule. This allows for planning for the survey as well as developing trend analysis. While surveys are vital in gauging customer satisfaction, they should not be considered a panacea. "The goal of the satisfied customer, like good marketing, must permeate the entire service delivery process, from planning through execution; if customer satisfaction is used only for post purchase assessment, then it is no more advanced than a sales force counting it's receipts."4

All indicators are that the use of surveys will continue to grow. Office of Federal Procurement Policy Administrator, Steven Kelman, has called on federal agencies to take part in a voluntary pilot program to determine the feasibility and value of conducting periodic customer satisfaction surveys on existing contracts.

We believe customer satisfaction will be the key for any organizations success. Surveys are one way to gauge how well you are meeting the customers needs. With a well developed survey you can measure how well you are meeting the mission and customer needs.

NEED HELP

We would like to acknowledge the help of Dr. Thomas Renckly, Air University Curriculum Coordinator, and the Air University Sampling and Surveying Handbook. The handbook is an excellent guide for anyone attempting to conduct a survey. You can request a copy of the guide through distribution or contact Dr Renckly at:

HQ AU/XOE 55 Lemay Plaza South Maxwell AFB, AL 36112-6335 (205) 953-7423 DSN 493-7423

If you are planning to do a survey which goes beyond your level of responsibility we would recommend referencing AFR 30-23, "The Air Force Personnel Survey Program." Contact:

AFMC/DPMYAS Randolph AFB, TX 78150 DSN 487-5680 or (210)652-5680

If you are interested in Office of Federal Procurement Policy (OFPP) sample surveys contact Mr. Chuck Clark at (202)395-6805.

Be sure to check with your local personnel shop before surveying. Some unions require coordination on any surveys of civilians. And finally, please feel free to share any information or questions you may have with us. Contact:

Mr. James Geiselhart ASC/PKCA Building 14 1865 Fourth Street, Suite 6 Wright-Patterson AFB OH 45433-7120

REFERENCES

"Assessment Training in One Page", Donna Sizemore, ASC/PK Communique, May 1994

"Surveys....A Way of Life", Scott Zingler, ASC/PK Communique, February 1994

"Treat Customers They Way You Want to be Treated", Maj Bruce W. Sickles, Sr., <u>TIG</u> <u>Brief</u>, May-June 1994

"Performance Surveys: Quality Tools Emerging For the 1990s", Thomas Rollins, Employment Relations, Summer 1992

"The Air Force Personnel Survey Program", AFR 30-23, 25 Jun 91

"Air University Sampling and Surveying Handbook", HQ AU/XOE, Revised 1993

QUOTES

- 1. "Surveying The Field", Richard Pasture, CIO, Jan 92
- 2. "The Customer Satisfaction Link to TQM", D. Jack Hensler, National Productivity Review, Spring 1994
- 3. "Survey Methods Questioned", David Chaudron, <u>Human Resource Professional</u>, Summer 1993
- 4. "Customer Satisfaction Fables", Dawn Iacobucci.Kent Grayson.Amy Ostrom, <u>Sloan Management Review</u>, Summer 1994

APPENDIX A

Determination of Sample Size and Representation

Once you determine your desired degree of precision and your confidence level, there are several formulas you can use to determine sample size depending on how you plan to report the results of your study. If you will be reporting results as percentages (proportions) of the sample responding, use the following formula:

$$n = \frac{P(1-P)}{\frac{A^2}{Z^2} + \frac{P(1-P)}{N}}$$

Where: n=sample size required
N= number of people in the population
P=estimated percentage of population
possessing attribute of interest
A=Accuracy desired, expressed as a
decimal (i.e., 01, 03, 05, etc.)
Z=number of standard deviation units
of the sampling distribution
corresponding to the desired
confidence level (see Appendix D)

If you will report results as means (averages) of the sample responding, use the following formula:

$$n = \frac{P^2}{\frac{A^2}{Z^2} + \frac{P^2}{N}}$$

Where: n=sample size required
N= number of people in the population
P=estimated standard in the population
A=Accuracy desired, expressed as a
decimal (i.e., 01, 03, 05, etc.)
Z=number of standard deviation units
of the sampling distribution
corresponding to the desired
confidence level (see Appendix D)

If you plan to report results in a variety of ways, or if you have difficulty estimating percentage or standard deviation of the attribute of interest, the following formula may be more suitable for use:

$$n = \frac{NZ^2 * .25}{[d^{2*}(N-1)] + (Z^2 * .25)}$$

Where: n=sample size required
N= number of people in the population
d=precision level (5%-.05, 10%-.10)
Z=number of standard deviation units
of the sampling distribution
corresponding to the desired
confidence level (see Appendix D)

We illustrate this formula with the following example. If the total population (N) is 10,000, and you wish a 95% confidence level and \pm 5% precision level (d = .05, Z - 1.96 from Appendix D), then

$$n = \frac{10.000 * 1.96^2 * .25}{[.05^2 * 9999] + (1.96^2 * .25)} = 369.98.$$

Hence a representative sample of 370 (369.98 rounded up) would be sufficient to satisfy your risk level. Inspection of the formula shows that the required sample size will increase if either:

the population (N) Increases, the confidence level (Z factor) Increases, or the precision Interval (d) decreases.

If you have stratified your population into more than one group, the size of each group will be its proportion (percentage) in the population times the total sample size as computed above. For example let's assume that we know (or can estimate) the population of Air Force military personnel to be distributed as follows: 70 percent male, 30 percent female and 65 percent enlisted, 35 percent officer. With that, we can determine the approximate proportions of our four homogeneous subgroups in the population:

Enlisted, male	.65 x. 70 = .455
Enlisted, female	$.65 \times .30 = .195$
Officer, male	$35 \times .70 = .245$
Officer, female	$35 \times .30 = .105$

Thus, a representative sample of the Air Force population (by sex and enlisted - officer affiliation) would be composed of 45.5 percent enlisted males, 19.5 percent enlisted females, 24.5 percent officer males, and 10.5 percent officer females. Each percentage should be multiplied by the total sample size needed to arrive at that actual number of personnel required from each subgroup or stratum.

Using the n of 370 calculated above, each of these strata should have the following sample sizes:

Enlisted, male	$370 \times 455 = 168.35 = 168$
Enlisted, female	$370 \times .195 = 72.15 = 72$
Officer, Male,	$370 \times .245 = 90.65 = 91$
Officer, female	$370 \times .105 = 38.85 = 39$

APPENDIX B

Table of Z Values

Confidence Level	z Factor
99.9	3.2905
99.7	3.0000
99.5	2.8070
99.0	2.5758
98.0	2.3263
95.5	2.0000
95.0	1.9600
90.0	1.6449
85.0	1.4395
80.0	1.2816

APPENDIX C

How to Use a Random Number Table

- 1. Number each member of the population.
- 2. Determine population size (N).
- 3. Determine sample size (M).
- 4. Determine starting point in table by randomly picking a page and dropping your finger on the page with your eyes closed.
- 5 Choose a direction in which to read (up to down, left to right, or right to left).
- 6. Select the **first** M numbers read from the table whose <u>last</u> X digits are between 0 and N. (If N is a two digit number, then X would be 2; if it is a four digit number, X would be 4; etc.).
- 7. Once a number is chosen, do not use it again.
- 8. if you reach the end of the table before obtaining your M numbers, pick another starting point, read in a different direction, use the first X digits, and continue until done.
- 9. Example:

N = 300; M = 50; starting point is column 3, row 2 on Random Number Table (next page); read down.

You would select population numbers 43, 13, 122, 169, etc., until you had 50 unique numbers.

TABLE of RANDOM NUMBERS

	11	2	3	4	5	6	7	8	9	10
1	06268	11040	92600	20621	00045	60606	48572	05017	51005	10052
1 2							86489			
3							43233			
4							19014			
5							53823			
5	33000	17705	15015	,,,,,,	54517	4000Z	33023	32703	70751	00212
6							37598			
7							36065			
8							40837			
9							09764			
10	92993	10747	08985	44999	35785	65036	05933	77378	92339	96151
11	95083	70292	50394	61947	65591	09774	16216	63561	59751	78771
12							30892			
13	_						43092			
14							64486			
15							31726			
16							48338			
17							08110			
18							69856			
19							65348			
20	89292	00204	00579	70630	37136	50922	83387	15014	51838	81760
21	08692	87237	87879	01629	72184	33853	95144	67943	19345	03469
22	67927	76855	50702	78555	97442	78809	40575	79714	06201	34576
23	62167	94213	52971	85974	68067	78814	40103	70759	92129	46716
24	45828	45441	74220	84157	23241	49332	23646	09390	13031	51569
25	01164	35307	26526	80335	58090	85871	07205	31749	40571	51755
26	29283	31581	04359	45538	41435	61103	32428	94042	39971	63678
27							07845			
28							06580			
29							40516			
30	36580	06921	35675	81645	00479	71035	99380	59759	42161	93440
31	በታታዩቦ	18002	31252	78156	07871	20360	53977	08534	30433	57216
32							37366			
33							21002			
34							78228			
35							96016			
55	7/002	17210	- 1 000J	39400	3007L	11-7-71	70010	70091	31043	71172
36							34112			
37							74002			
38							27823			
39							15293			
40	45142	96804	92834	26886	70002	96643	36008	02239	93563	66429

(APPENDIX A-C ARE FROM THE AIR UNIVERSITY SAMPLING AND SURVEYING HANDBOOK)

Do 360-Degree Performance Appraisals Have a Future in the Air Force?



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DO 360-DEGREE PERFORMANCE APPRAISALS HAVE A FUTURE IN THE AIR FORCE?

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ABSTRACT

The Air Force has been rapidly striving to transform itself into a Total Quality organization. Yet, many military members point to Dr. W. Edwards Deming's denouncement of performance appraisals with skepticism. This paper explores an alternative to the existing Air Force performance evaluation system--360-degree appraisals. A "360-Degree Performance Evaluation" means that the employee is evaluated from multiple viewpoints--supervisor, subordinates, peers, and external customers.

Twenty members of USSTRATCOM have already participated in experiments with two-way performance feedback between supervisors and subordinates and between peers. This limited, but promising research is an initial step in determining whether 360-degree performance appraisals might offer the Air Force an evaluation system that is more consistent with the Total Quality approach to leadership.

INTRODUCTION

Many skeptics point to Dr. W. Edwards Deming's denouncement of performance appraisals as an excuse for not implementing Total Quality. Deming contends that performance appraisal systems typically induce a lack of teamwork, emphasize short-term results, and inappropriately attribute variation in performance (good or bad) to the employees rather than the system in which the people must work (Out of the Crisis 101-120). On the other hand, conventional wisdom says performance reports are necessary for giving employees feedback, selecting recipients of awards and recognition, and making promotion and dismissal decisions (not to mention handling the ensuing complaints of discrimination).

The views expressed in this paper are those of the authors and do not reflect the policies of the United States Air Force, the United States Strategic Command, or the Department of Defense

Although there has been at least one study (PACER SHARE) to determine the effects of eliminating traditional performance appraisals for DoD civil service personnel assigned to the Distribution Division at the Sacramento Air Logistics Center (SM-ALC), we are unaware of similar efforts within any of our armed services (Federal Quality Institute Magazine, page 9). For the foreseeable future, performance reports will probably continue to play a key role in selecting personnel for promotion, unless the military services resort to an advancement system based strictly on longevity. Even though we know that the performance appraisal is a necessary management tool, it has been and will continue to be a widely investigated management function (Group and Organization Studies 143). Therefore, the authors of this paper feel that, if the Air Force is serious about Total Quality, it may need to consider developing a performance appraisal system that is free of the faults Deming speaks of. Because of these faults, The U.S. Army Management Engineering College (AMEC) in Rock Island, IL., is one of the first federal agencies to totally implement a 360-degree appraisal process using a customized, 6-step process that involves their employees right from the beginning--a system more consistent with Total Quality (AMEC Brochure 1). A 360-degree approach to performance evaluations is what the authors of this paper advocates.

360-DEGREE PERFORMANCE EVALUATION CONCEPT

When we refer to the term "360-Degree Performance Evaluation", we mean that each and every employee within an organization receives performance evaluations from multiple viewpoints--not only from his or her immediate supervisor, but also from his or her subordinates, peers and customers. The employee reciprocates by also evaluating all these people, including his or her supervisor.

The typical method of accomplishing performance evaluations, is a one-sided assessment of the ratee in the eye of the rater only, which is sometimes merely an assessment of the ratee's variations in performance (both good and bad). Because of the way the 360-degree performance evaluation approach is structured, it can enhance the present performance appraisal system by balancing what are known as the "halo" and "horn" effects of performance evaluation writing, which normally result from a rater-to-ratee evaluation that is overly complimentary or overly critical (Training and Development 71).

The 360-degree performance assessment provides a comprehensive evaluation of an employee's skills, abilities, styles, and job-related competencies from all directions within the organization's productivity cycle (Training and Development 69). It allows individuals to see themselves as others see them, to understand how their behavior is impacting others, and to correct any performance problems. If an employee can acknowledge and accept critical, but accurate, feedback from such a myriad of feedback providers, that employee will be, without a doubt, on the way to better job performance.

Not only does the 360-degree performance evaluation benefit the individual by giving him or her a more accurate guide on which to base personal improvement efforts, it also benefits the organization. No longer can individuals try to "get ahead" through competitive, self-serving actions designed to impress the boss. Employees will have to become team players and act in the

interests of the organization and its customers because they will be evaluated from all these viewpoints. To evaluate one another, supervisors, subordinates, colleagues, and customers will have to communicate their expectations (HR Magazine 68). If they don't want to be losers under the new evaluation system, they will be forced to come to agreements on common goals and solve problems together. This basically means that cohesiveness within the workcenter and partnerships with customers should replace competition. The organization's ability to satisfy customers (both internal and external) should improve as a result of improvements to both the overall work system and the individuals within it.

CONDUCT OF SMALL-SCALE EXPERIMENTS

During the mid 1980's, the Air Force had revamped its performance evaluation system by separating the processes for: (1) permanent documentation of the Air Force member's performance (Officer and Enlisted Performance Reports), and (2) periodic feedback to the Air Force member (Performance Feedback). One rationale for this change was to ensure the individual received the honest feedback a supervisor might be reluctant to include in a performance report which has a potentially far-reaching impact on the person's promotability or retainability in the service.

Based on this knowledge, and believing that the 360-degree performance evaluation concept might have a future in the Air Force, the United States Strategic Command (USSTRATCOM) Intelligence Directorate's Quality Office embarked upon a small-scale experiment that would test the 360-degree approach for the feedback portion of the evaluation system. Rather than immediately launch a full-blown 360-degree appraisal effort, this office decided to start with a more restricted test.

The effort was initially limited to the five members assigned to this office and to a simple reversal of the performance feedback process between the supervisor and each subordinate. In other words, every time the officer in charge (OIC) conducted a formal feedback session for one of her people, the feedback recipient also provided feedback to the OIC.

When the office disbanded, the OIC and two of her teammates were reassigned to the USSTRATCOM's special staff working in the Command Quality Office (USSTRATCOM/J008) as quality advisors. This new cadre eventually grew to six personnel. After some discussion, the performance feedback experiment was continued and expanded to include two-way feedback sessions between every possible pair-wise combination of personnel assigned. Additionally, one of the former members of the Intelligence Directorate's Total Quality Office started two-way supervisor-subordinate feedbacks within his new workcenter (Defensive Missile Production Section - USSTRATCOM/J222). To date, these two experiments have included a total of 20 personnel.

The goal is to encourage other interested offices to initiate two-way supervisor-subordinate feedback, then progress to peer-peer feedback, and eventually expand feedback to a complete 360-degree effort which would include customers external to the office.

Here are some additional details on how the two-way performance feedback sessions during the aforementioned experiments have been conducted:

- (1) AF Forms 724 (Commissioned Officers), 932 (Noncommissioned Officers), and 931 (Airman) have been used for all feedbacks. (Interestingly enough, one of our subjects was a Navy Petty Officer, who was totally unfamiliar with the concept of separate performance feedback and performance evaluation.)
- (2) In preparing the form for each feedback session, the participant is instructed to record two strengths and two "opportunities to grow" in the comments block. These areas are to be common practices or characteristics of how the person performs (emphasis on performance, not the person himself/herself). These areas must be something the person has control over. Along with each "opportunity to grow," the feedback provider must give at least one specific suggestion of how to improve. Additionally, the feedback provider should make an appropriate mark on the continuous scale for each factor he or she has sufficient knowledge to evaluate.
- (3) Each two-way performance feedback is conducted in a private, face-to-face session. Sessions between each twosome are conducted every six months.
- (4) At this point, all participation in the two-way feedback sessions has been voluntary. So far, no one in the two participating offices (among those who have been approached) has declined to participate.
- (5) After the individual receives performance feedback from all his/her providers, it is at the individual's discretion whether or not to share the feedback results with his/her supervisor. Employees should use the feedback from the other providers to objectively compare their own perceptions of their skills, abilities and styles with that of their supervisor.

RESULTS OF EXPERIMENTS

In a positive attempt to refute Deming's argument that all performance appraisal systems should be "purged from the earth," the results of our experiment were analyzed to see whether the 360-degree approach might offer a viable alternative to evaluation systems which are rife with the afflictions cited by Deming (Group and Organization Studies 145).

We surveyed half of the participants in the aforementioned small scale experiments by providing them a questionnaire to find out (1) what their feelings were toward the effectiveness of the 360-degree performance feedback method, and (2) how well this method supports our argument against Deming's attack on performance evaluation systems.

Overall, we discovered our survey responses reflected results similar to those experienced in other organizations. Implementation of the 360-degree performance feedback approach helps facilitate the development of quality people by creating a culture where people are comfortable talking to each other to get some honest and critical feedback about weaknesses and strengths of their performance (Omaha World Herald 18). At the same time, this approach allows

participants to come to a mutual understanding of common goals of the organization (HR Magazine 68).

Here are some additional details of our assessment of the outcome of the survey:

- (1) Was the feedback process detrimental to teamwork? This method does not destroy teamwork; in fact, survey respondents reported that it strongly enhances teamwork by building cohesiveness within the workcenter, defusing the competitive state of mind, and opening up lines of communications between all personnel assigned within the work environment. Normally, only supervisors and subordinates take time to attempt to understand one another's viewpoints. Others within the workcenter feel that it is the supervisor's problem to correct workcenter deficiencies, whether the shortcomings are a result of the people or the system in which the people must work. This 360-degree feedback system makes the participants feel like they are all part of the same team and have an input on how to improve the workcenter's performance.
- (2) Did the feedback providers focus on short-term results? For the most part, feedback recipients felt their feedback providers did <u>not</u> focus on short-term results but rather on day-to-day performance. This may have been because the Air Force performance feedback forms do not facilitate Management by Objective-type evaluations (one reason why we chose to use these forms). In one case, however, a feedback recipient felt she received low marks from a subordinate as a result of a verbal counseling (for bad performance) she had administered to the individual several weeks earlier.
- (3) Did the feedback process inappropriately attribute variations in performance to the person rather than the system? According to Deming, the main reasons why the performance appraisal system increases variability in workers' performance is predominately because of factors outside the individual's control and because supervisors and management not only do not understand the problem, they also do not understand their role in causing the problem. (Quality Progress 44)

Almost all the feedback recipients felt they did receive feedback on items they had control over. However, several feedback providers felt that a new form should be devised to better facilitate their giving feedback on suitable areas of performance.

- (4) How did the participants feel about the feedback process? Although a few participants initially felt a little uneasy, awkward, or skeptical about receiving feedback from their peers and subordinates, or giving feedback to their peers and supervisor, everyone reported positive experiences with the process—with only one exception. The one negative instance was the feedback provided by the subordinate who had recently received a verbal counseling. However, the supervisor who received that feedback felt the sessions with his other three subordinates were positive.
- (5) Should this process be implemented throughout the military? All survey participants thought highly of this process and felt that the 360-degree performance feedback concept should

in fact be implemented Air Force-wide ("military-wide", in the case of the Navy Petty Officer who participated in the experiment).

EXPANDING SCOPE

Historically, doing performance appraisals is usually not one of the supervisor's favorite tasks. The 360-degree approach magnifies the task by forcing everyone, including non-supervisory personnel, to evaluate practically everyone else. Add to this the fact that the prospect of receiving feedback can be almost as trying as giving feedback and the enthusiasm for 360-degree feedback will not be very high--initially. For that reason, our recommendation is to phase in 360-degree evaluation.

Start by having the senior member of the organization or workcenter offer his/her subordinates the opportunity to reverse the supervisor-subordinate feedback process. Once these subordinates experience the value of this process, they will hopefully be willing to follow their boss's example. When two-way supervisor-subordinate feedback becomes fairly well institutionalized in the organization or workcenter, expand it to peers and external customers. The inclusion of external customers will culminate in a complete 360-degree performance feedback process and should prompt the start of the two-way feedback concept within the organizations or workcenters of these customers.

After personnel become comfortable with 360-degree performance feedback, there may come a day when organizations and workcenters can begin exploring the use of 360-degree data to permanently document performance in an individual's performance reports. Most people probably believe it would be a long time before the Air Force would embrace such a change service-wide.

CONCLUSION

The Objective of this paper was to explore the potential for a new way of doing Air Force performance appraisals which would be **more consistent with Total Quality**. Instead of fostering competition, management needs to put a greater emphasis on teamwork and on the development and motivation of all employees, rather than on the performance appraisal system itself. Management needs to foster the idea that every employee within an organization has external and internal customers to serve, the most important of whom is usually not the immediate supervisor.

Our experiments with two-way supervisor-subordinate and peer-peer feedback were limited, yet promising. The multi-directional performance feedback seemed to be fairly free of the ills cited by Deming and, in fact, produced the positive results we sought. The authors of this paper believe that further research on this topic would be worthwhile. Suggestions include:

- (1) A test with subjects who are non-volunteers.
- (2) Further testing to determine the validity of evaluations received from a subordinate who has recently been reprimanded.

- (3) A test should be conducted with customers external to the feedback recipients' workcenter or organization to include providers selected by the recipient and by his or her immediate supervisor.
- (4) An experiment should be conducted to determine whether the 360-degree evaluations a person receives vary depending on whether the purpose is permanent documentation of the service member's performance or strictly feedback to the individual.

BIBLIOGRAPHY

- Carson, Kenneth P., Robert L. Cardy, and Gregory H. Dobbins. "Performance Appraisal as Effective Management or Deadly Diseases (Two Initial Empirical Investigations." <u>Group and Organizational Studies</u> June 1991: 143-159
- Deming, W. Edwards. <u>Out of Crisis</u>. Cambridge: Massachusetts Institute of Technology, 1986. 101-120
- Kane, Jeffrey S., and Edward E. Lawler III. "Methods of Peer Assessment." Psychological Bulletin 1978: 555-586
- Newman, Constance B. "Quality Improvement Prototype Award." Federal Quality Institute Magazine 1991: 9-12
- No Author. "Companies Trying for Less Painful, More Productive Evaluations." Omaha World Herald, 30 Jan. 1994, Evening edition: 18
- Nowack, K. M. "360-Degree Feedback: The Whole Story." <u>Training and Development</u> January 1993: 69-72
- Scherkenback, W. "Performance Appraisals and Quality: Ford's New Philosophy." Quality Press April 1985: 40-46
- Sobel, Bob. "360 Degree Feedback." Appraisal Technologies Brochure 1993: 1
- No Author. "360 Degree Appraisal: A Case Study." <u>U.S. Army Management Engineering</u> College (AMEC) Brochure 1994: 1
- Waldman, David A. and Ron S. Kenett. "Improve Performance Appraisal." HR Magazine July 1990: 66-69

Fighting for Feedback in ACC



Jeanie Spence



2d Lt Scott Hopkins

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Fighting for Feedback in ACC

Jeanie Spence &

2Lt Scott Hopkins
Air Combat Command

ABSTRACT

This paper examines the driving force behind the successful deployment of Air Combat Command's Culture and Leadership Survey. The automated survey, which was originally adapted from an Aeronautical Systems Center model and used extensively in Tactical Air Command, is a powerful tool to help assess cultural change in the organization. To continue to meet future challenges in an increasingly dynamic environment, commanders must create a working climate where trust, teamwork, and continuous improvement can flourish. Shaping a bright future for the Air Force goes hand in hand with creating the kind of climate that has a positive effect on the way people think and approach their jobs. It takes a fighting spirit to do this well. It means asking the right questions to find out if leadership is succeeding in this important area. It's time to find out if the walk matches the talk. It's time to prime the pump to get ideas flowing freely. It's time to fight for feedback.

INTRODUCTION

As a force provider, Air Combat Command (ACC) organizes, trains, equips, and maintains combat-ready forces for rapid deployment and employment while ensuring strategic air defense forces are ready to meet the challenges of peacetime air sovereignty and wartime air defense. Created in June 1992 from components of the former Tactical Air Command (TAC), Strategic Air Command (SAC), and Military Airlift Command (MAC), ACC was steeped in the proud heritage of each organization--yet poised to create its own distinct culture. At the ACC Commanders' Conference held a month later, the senior leadership completed its first order of business and defined the new command's mission statement as follows:

"AIR COMBAT COMMAND PROFESSIONALS...
PROVIDING THE WORLD'S BEST COMBAT AIR FORCES,
DELIVERING RAPID, DECISIVE AIRPOWER ANYTIME, ANYWHERE."

INITIATING ACC QUALITY

A few months before the new organization stood up, General John Michael Loh--selected for reassignment from Commander TAC to Commander ACC--began communicating his vision of creating a quality culture within Air Combat Command. At the first gathering of the commanders in July 1992, he introduced them to the principles of ACC Quality and charged them with the responsibility for deploying this operating style throughout the command. He challenged them to

understand and internalize the definition of ACC Quality: "A leadership commitment to an operating style which creates a working climate that promotes trust, teamwork, and continuous improvement in all that we do." General Loh instructed them in still another facet of ACC Quality--the six elements of "Our Style"--to guide the leadership at all levels of the command:

- Create a climate of trust, teamwork, quality, and pride.
- Give everyone a stake in the mission and its outcome.
- Delegate authority and responsibility. Accept accountability.
- Set goals. Measure progress. Reward performance.
- Deliver quality products to all customers.
- Strive for a culture of continuous improvement. Make it better.

This was the genesis of the ACC Quality initiative, a holistic approach characterized by a clearly defined leadership style; a pervasive culture--fostering a mindset of quality; a focus on process, product, and customer; a decentralized organizational structure; and a team-based approach to performance. In the months that followed, the ACC leadership focused their attention on what they wanted to accomplish in 1993 and corporately developed the following five major goals:

- IMPROVE OUR COMBAT CAPABILITY by meeting ACC quality performance measures in operations, logistics, support, medical, and training programs.
- EMBRACE A CULTURE OF ACC QUALITY in everything we do, creating a leadership style and working climate that inspires trust, teamwork, and continuous improvement.
- STRENGTHEN AIR COMBAT COMMAND by providing the world's best combat air forces--delivering rapid, decisive airpower--anytime, anywhere.
- IMPROVE SAFETY PERFORMANCE by fostering a culture of safety in the air and on the ground.
- CREATE A SPIRIT OF WELLNESS AND FITNESS in all our people through quality physical, mental, and spiritual programs.

ASSESSING THE QUALITY CULTURE

BACKGROUND

When General Loh was Commander of Tactical Air Command, he directed his Quality Improvement Office to research the options available for assessing the working climate. The quality initiative was six months old, and he was eager to receive feedback on how well it was being deployed and received throughout the command. A number of surveys and survey methods were explored, and General Loh ultimately approved the use of an automated survey developed at Aeronautical Systems Division (ASD), then a part of Air Force Systems Command. With permission and assistance from ASD, TAC tailored the survey and deployed it throughout the command in November 1991 and again in May 1992. The survey proved to be a valuable tool, providing the commanders an assessment of the working climate with both quantifiable data as well as comments from the work force.

Originally, General Loh wanted the surveys conducted at 6-month intervals; however, he readily agreed to change that policy to 12-month intervals based on the field's request for more time to analyze the data and provide survey results to unit personnel. The second TAC survey was nearing completion as ACC was activated. General Loh decided to continue using this toolused successfully to survey over 60,000 people in the last TAC cycle--to assess the quality culture in Air Combat Command.

A QUALITY APPROACH

Taking a cue from the example set by the ACC leadership, the Quality staff agreed that it would simply not do to "recycle" the TAC survey to a distinctly new population made up of former TAC, SAC, and MAC personnel. The ACC Commanders' Conference set the tone for embracing change and seeking consensus. Giving everyone a stake in the mission and its outcome--ACC's second element of style--requires imparting a sense of ownership. Ownership was important to the commanders in developing the ACC mission statement and would be equally important in adopting a means for assessing the organizational climate in each ACC wing. After all, the commanders were the key customers of this tool and the information it would provide; therefore, their inputs were critical. The TAC surveys clearly showed that an effort of such magnitude is not possible without strong support (i.e., buy-in) from the leadership.

Based on these assumptions, two decisions were made: (1) the former non-TAC units would run a test of the survey in November 1992, and (2) all ACC units would review and comment on the questionnaire before the survey was approved for commandwide deployment in May 1993. In addition, the command survey project officer held a workshop in the field to acquaint the new survey administrators with the process.

The results appeared to confirm that the approach was the right one. Over 30,000 ACC personnel took the "test" survey in November 1992 which provided the participating units with a baseline climate assessment and valid, actionable data. As requested, thoughtful and constructive comments on the questionnaire flowed in from all over the command. A significant number of the units liked the survey just as it was, and other suggestions were incorporated into the questionnaire that would serve as the ACC baseline.

ACC CULTURE AND LEADERSHIP SURVEY

What methods and/or indicators are available to help today's Air Force leaders assess the working climate? Commanders have typically used hot lines, suggestion boxes, grievances, IG complaints, absenteeism data, productivity reports, participation in unit social functions, and personal interaction with the troops to assess employee satisfaction and well-being. How then can the commander take all these data points, correlate them, track them over time, and determine if the bottomline output measure is a more satisfied and empowered work force--one that perceives the culture of the organization indeed reflects trust, teamwork, and continuous improvement? What about the individuals who are less vocal, less inclined to complain even if they feel hindered or thwarted in their attempts to contribute their ideas? General Loh insists that creating a working climate that encourages the free flow of ideas cannot be overemphasized. During Vice

President Gore's June 1993 visit to HQ ACC--one of the first stops on his fact-finding tour for the National Performance Review, General Loh explained why the fight for feedback is so important:

... We want [our people] to embrace the quality culture, and we want to know what is preventing them from doing that. We want to know how strongly they feel about it. What are their missions and what is their output? We have good people. They want to do well. They want to own the organization, and we want ownership by membership. They want to reduce hassle and frustration. What's preventing them? Is it loyalty to function, people protecting turf? . . . That kind of attitude is what kills initiative.

Another simple, yet profound precept of ACC's operating style set forth by General Loh is the respect for the dignity of every person, regardless of their rank or position: "No one in ACC is more or less important than anyone else." How do you convey to the lowest ranking individual in the organization, for instance, that his or her input is valued? One way to do this is to simply ask, "What do you think?"

Deployed for the second time in May 1994, the ACC Culture and Leadership Survey (ACLS) is a leadership tool used to assess the health of the quality culture at all levels of the command. Going back to the definition of ACC Quality, leadership commitment is the impetus for creating a working climate of trust, teamwork, and continuous improvement. Therefore, the desired outcome of this demonstrated commitment is an ACC culture that reflects all he attributes of a quality culture. Again, leadership is the key.

ACLS OBJECTIVES

The specific objectives of the survey are as follows: (1) conduct an annual organizational climate assessment; (2) provide a mechanism for gathering unfiltered feedback from unit personnel; (3) identify strengths and areas for improvement; and (4) serve as a tool for increasing awareness of the command quality initiative.

ACLS POLICY

The command policy for administering the annual survey incorporates these guidelines:

- (1) The survey is administered annually in the May-June time frame.
- (2) The survey is completely anonymous--to protect the confidentiality of each person's responses as well as individual unit results. For example, commanders receive their own unit results, but individual squadron results are not published throughout the wing. Likewise, when the command results are published, they include the individual scores from each wing but do not identify the units by name.

- (3) Maximum participation is accomplished by setting a stretch goal (65 percent or higher in 1993 and 75 percent or higher in 1994). ACC prefers a census-type approach for these reasons: to give everyone an opportunity to give their personal assessment of the organizational climate and to reinforce the importance of each individual's input.
- (4) The Quality Improvement Office at each wing is responsible for administering the survey and acts as trusted agent of the survey data.
- (5) Individual unit (wing, group, or squadron) commanders provide their people with feedback on the survey results and use the data to help focus their improvement efforts.

ACLS DEMOGRAPHICS

The survey is designed to collect the following demographic information:

(1) Squadron, group, wing, and wing-equivalent designations (the command headquarters, numbered air forces, centers, and air defense sectors are treated as wing-equivalent units for the purpose of the survey). Since HQ ACC and most of the wing-equivalent units are organized by functional area, they are coded as "Other"--and the functional areas (i.e., Plans & Programs as shown in Figure 1 below) are considered parallel to squadrons. There are normally three layers of reports for the wing and two layers of reports for wing equivalents. For the purpose of comparing group results across the command (Operations, Logistics, Support, and Medical), wing-equivalent data shows up in the "Other" column.

Wing or Wing Equivalent: Group Designation: Squadron Designation:	Operations Group	HQ ACC Other (Group N/A) Plans & Programs/XP
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Figure 1

- (2) Status/rank. There are two breakouts for officers (O1-O3 and O4-Above), two for enlisted personnel (E1-E5 and E6-E9), and two for civilians (Nonsupervisor and Supervisor). These are broad categories selected for the sake of simplicity, yet a noticeable pattern emerges when comparing the mean results from these groups.
- (3) Time-in-service. There are four breakouts for the individual's total active military service or federal civil service: 1 to less than 4 years, 4 to less than 10 years, 10 to less than 15 years, and more than 15 years.
- (4) Hours of formal Quality training within the last 12 months. There are five breakouts to help assess the level of training across the command for each status/rank designation: none, 1-8 hours, 9-16 hours, 17-40 hours, and more than 40 hours.

All of the information requested above is optional (with the exception of the organizational descriptors entered by the survey administrator when labeling each disk). Respondents concerned about anonymity can simply skip the demographic questions.

ACLS FORMAT

The survey contains 50 declarative statements, on a 1-7 Likert scale (from Strongly Disagree to Strongly Agree), which are divided into six categories:

- (1) WORK ENVIRONMENT (statements 1-15): To assess how the day-to-day working conditions, atmosphere, or climate of the work place is perceived.
- (2) JOB SATISFACTION (statements 16-23): To assess some of the factors that contribute to enhanced performance and a sense of accomplishment and personal fulfillment from the job.
- (3) MISSION (statements 24-29): To assess some of the factors that impact the unit's mission and goals as they relate to improving ACC's combat capability.
- (4) COMMUNICATION (statements 30-36): To assess the effectiveness of communications and feedback within the unit.
- (5) ACC QUALITY (statements 37-41): To assess the impact of the ACC Quality initiative within the unit.
- (6) LEADERSHIP (statements 42-50): To assess the level of confidence and trust in the leadership's ability to carry out their responsibilities.

In addition to scoring each statement on the 1-7 scale (or selecting "No Response" as appropriate), the individual can enter an optional two-line comment at each of the 50 statements, if desired. At the end of the survey, the individual is afforded one last opportunity to add a comment of up to eight lines.

SURVEY ADMINISTRATION

ACLS is an automated survey to align with ACC's "paperless environment" initiative. The headquarters survey project officer transmits the ACLS administration programs to all wing and wing-equivalent units via the command electronic bulletin board (BBS). Survey administrators from each wing's quality improvement office download the programs from the BBS via modems and install them on their computer hard drives.

The software includes everything the wing needs to create and label survey disks; merge/ analyze data; and generate reports for the wing, group, and squadron commanders. Wing and subordinate-level administrators distribute disks to the work centers and set up dedicated computers at central locations to make the survey accessible to all personnel. After the administrators have merged all data at the end of the survey period, they upload a single wing data file to the BBS for headquarters retrieval. They save all narrative comments to a separate file and retain them at the wing. The headquarters survey project officer uses the same process to merge all wing data files to obtain the command results.

1993 SURVEY RESULTS

PARTICIPATION

ACC's participation goal for the 1993 survey was a minimum 65 percent of the eligible population (based on the number of assigned personnel minus 10 percent for deployments, extended TDYs, and schools). Over 94,000 ACC people from 50 major units took the survey-which represented 73 percent of the total number eligible. Disk failures and miscellaneous software problems that were reported by the administrators accounted for .5 percent (or 485) lost surveys--resulting in a total of 93,550 actual records.

SURVEY REPORTS

As mentioned earlier, the ACLS programs provide the wing with everything they need to conduct the survey and obtain their own results. They have their own reports in hand before the command results are available--consistent with ACC's philosophy of decentralization and empowerment. Squadron, group, and wing commanders, as well as headquarters and wing-equivalent commanders and functional area chiefs, receive the following tabular reports that include the high, low, and mean scores for each of the 50 statements and the six categories:

• Unit: Results broken out by wing, squadron, or functional area--depending on

the level generating the report

• Group: Results broken out by group--Operations, Logistics, Support, Medical,

Support, Wing Staff, and Other (intended for wing and command level)

• Status/Rank: Results broken out by respondents' status/rank

• Time-in-Service: Results broken out by respondents' total years of service

• Quality Trng: Results broken out by respondents' current hours of quality training

The 1993 survey constituted the baseline assessment of ACC's culture and leadership as perceived by the members of the command. The following graphs provide more insight from the aggregated command data that represents all 93,550 surveys.

STATUS/RANK RESULTS

Looking at the mean of all questions by status, one can readily see that officers have a more favorable impression of the organizational climate than that of civilians (by .14) and the enlisted force (by .22). Without going into all the possible reasons why this is so (the topic of another paper, perhaps), it is important to note that perceptions differ depending on one's rank.

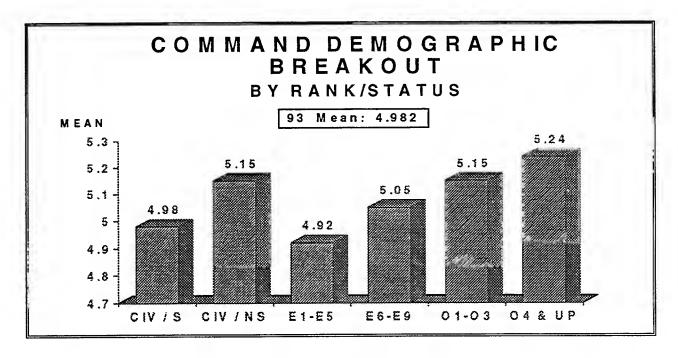


Figure 2

A closer examination of these demographic groups reveals that higher perceptions correlate with increased rank and grade. Higher ranking officers, enlisted personnel, and civilians score the command culture and leadership higher than those with lesser rank and grade within each group (supervisory civilians: .17 of a point higher than nonsupervisory civilians; E6-E9: .13 higher than E1-E5; and O4 and above: .09 higher than O1-O3). Comparing all six breakouts to each other, the greatest difference (.32) is between O4 and above and E1-E5.

CATEGORY RESULTS

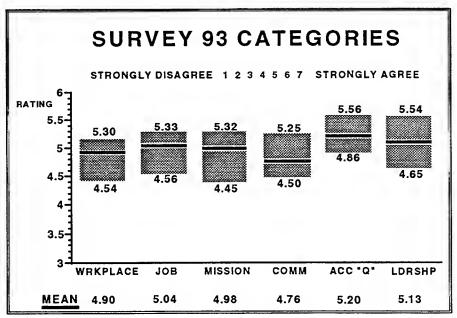


Figure 3

The command results for 1993 identified ACC Quality as the highest rated category in the survey, with a mean score of 5.20. Communication was the lowest category, with a mean of 4.76. The high and low numbers above and below each bar (Figure 3) reflect ACC's highest and lowest participating unit (wing or wing equivalent) for each of the six categories. A similar wing report would reflect the mean of the data from all personnel assigned to that wing and the range of the individual squadron results.

COMPARING ACLS '93 TO PRIOR YEAR RESULTS

Using data from the 1991 TAC survey and two 1992 surveys (one conducted by TAC units on the eve of ACC's activation and one by former MAC and SAC units five months later), a trend line for each of the six categories can be observed (Figures 4 and 5). A caveat must be made that minor revisions, clarifications, and refinements--not intended to change the context--were made to the individual questions over this period of time; however, the survey categories remained unchanged. The scores from the two 1992 surveys were statistically combined in order to have a single data point for each category for each of the 3 years.

Comparing the categories only, not individual statements within the categories, a positive trend emerges in five out of six areas. The Mission category shows the only negative change with a delta of .09 points. The ACC Quality trend reveals the most dramatic change since 1991 (+.57), followed by Work Place Environment (+.40), Communication (+.37), Job Satisfaction (+.31), and Leadership (+.21).

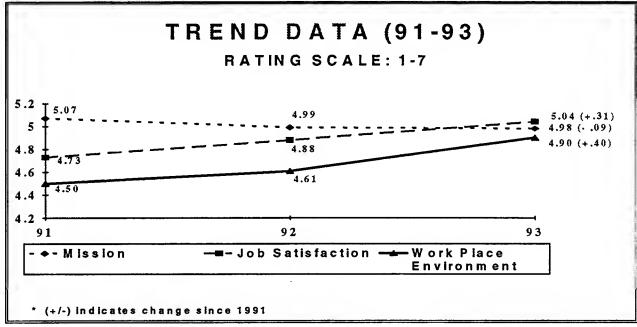


Figure 4

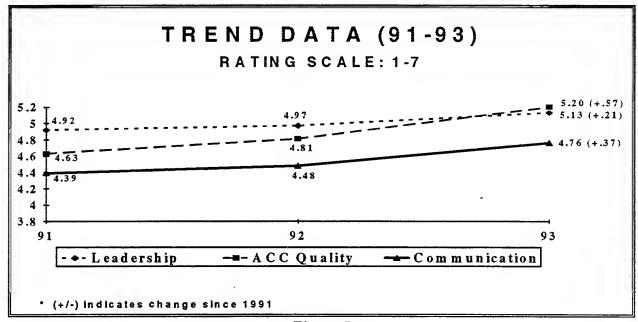


Figure 5

General Loh expressed his own amazement at these results in his briefing to Vice President Gore on the ACC Quality approach:

... I was struck with the large improvement in our quality transformation. Why? We have gone through massive downsizing and restructuring the past two years. Our people have had every reason to whine, complain, and gripe. So I fully expected the results of our survey this year to reflect much lower morale, pride, and self-actualization. But, just the opposite has happened

BENEFITS OF THE SURVEY

The ACC Culture and Leadership Survey is paying big dividends. It facilitates direct, unfiltered feedback. Commanders gain additional insight from their people to enable them to make more informed decisions. All levels of the command can assess their organizational climate, compare their results to others across the command, identify strengths and weaknesses, target areas for improvement, and track their progress from year to year. The data can be used in the Unit Self-Assessment process to measure employee satisfaction and well-being (reference Category 4 of the QAF Criteria) and subsequently help prepare the organization for a Quality Air Force Assessment (QAFA). It serves as an educational tool to increase quality awareness, enhance communication, and motivate and encourage everyone to become fully engaged in the quality process. Most important of all, it reinforces the importance of each individual's input.

Even ACC's closing bases want to take the survey in 1994. They know it takes considerable time and effort to administer the survey using a census-type approach, but they believe the value of the information received is worth the investment. Closing bases still need a climate of trust and teamwork. Like all the other ACC units, they are looking forward to what they will learn from this year's assessment. When it comes to getting feedback, they are willing to go the distance.

GAP Analysis – The Process



Mr. Brian J. Strickland

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GAP ANALYSIS-THE PROCESS

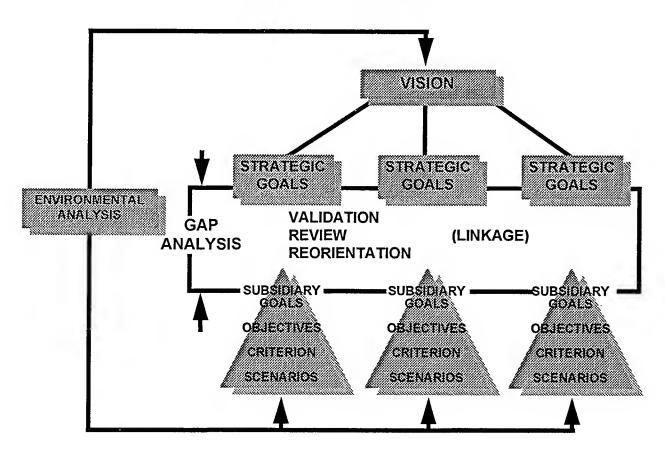
Brian J. Strickland, MBA, MPA HQ ACC/LGCR

<u>ABSTRACT</u>: Emphasizes the role of Gap Analysis as a validation process for Strategic Goals. Identifies the Environmental Analysis as the common factor in strategic and subsidiary level planning. Introduces a Gap Analysis model that identifies the component parts of the process and illustrates their interrelationship.

PURPOSE

Validation and review of Strategic Goals emanating from the Vision Statement are one of the primary reasons to develop a comprehensive Gap Analysis. The Gap Analysis process links a subsidiary organization's goals to the strategic goals developed by a higher command level. The

GAP ANALYSIS LINKAGE

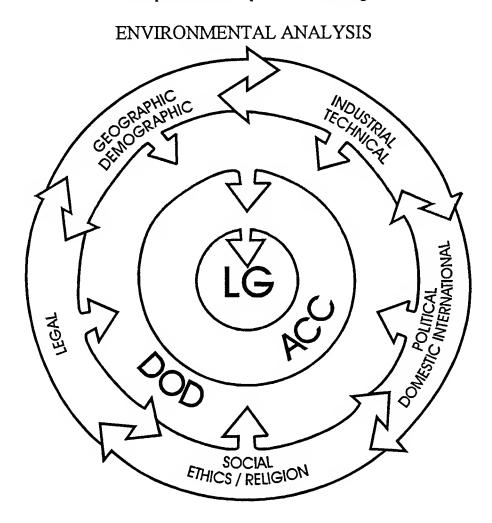


variance between these levels of established goals constitutes the "gap" in perception and interpretation between the levels of organization. Used constructively this "Gap Analysis" can provide a basis for improved vertical communication.

For the higher organization the process begins with the development of a Vision Statement. The basis for the Vision Statement is a comprehensive Environmental Analysis. The Vision Statement will, in turn, provide the parameters for the Strategic Goals. Comparing the Strategic Goals with the subordinate goals will provide validation and a basis for review of the Strategic Goals. It will also measure the congruency between the organizations' level of perception.

THE ENVIRONMENTAL ANALYSIS:

Development of a comprehensive Environmental Analysis is an ongoing task. Investment in time and resources to ensure the veracity of this document is essential to the validity of the entire process. The following illustration identifies the components of environmental analysis required at the ACC/LG level for optimum development of a Strategic Plan.



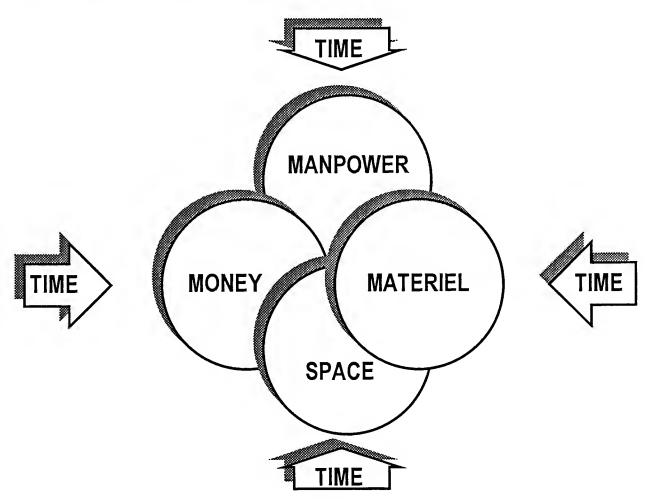
Data is required from each of the segments and requires a reasonable background in research methodology. Components of the Environmental Analysis are: Political (Domestic/International), Social (Religious/Ethical), Legal, Geographic/Demographic and Industrial/Technical.

Research and analysis into future impact projections should be conducted by experts from each particular segment. Sources available include AFIT theses, Air War College Graduate studies, Doctoral studies from Civilian Universities and input from Officer and NCO students who have done research in the various disciplines. Other sources should not be excluded and this list should be considered as only a preliminary example.

Once the research documents projecting findings into the planning future (usually five years) are completed, a planning synopsis can be developed and used to develop the Vision Statement and the Strategic Goals, while providing subordinate units with a macro basis for their planning process. Sub-elements of each component should address the impact on the four renewable assets of Manpower, Materiel, Money, and Space. The non-renewable asset of Time will provide focus for the other four.

THE PLANNING FACTORS(ASSETS)

Manpower, Material, Money and Space are renewable assets. Each has a definitive life cycle and each is interchangeable. Problems in one area can be resolved by application of

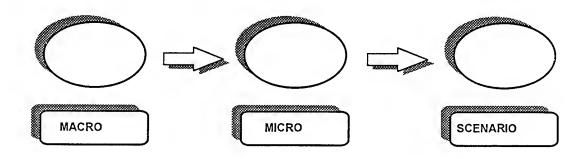


elements from the other areas. Time is the one factor (asset) which is non-renewable (until we come up with a Time machine). Once it is gone, it is gone. There are three kinds of time to

consider. Investment time (where we are working towards a future goal), payoff time (where we are securing the anticipated goal) and wasted time (which we are attempting to minimize). Each segment of the Environmental Analysis will affect, or be influenced by the degree of availability or lack of, one or more of these elements. They are the building blocks of Strategic Planning for their availability or their shortage will determine success or failure of the goals.

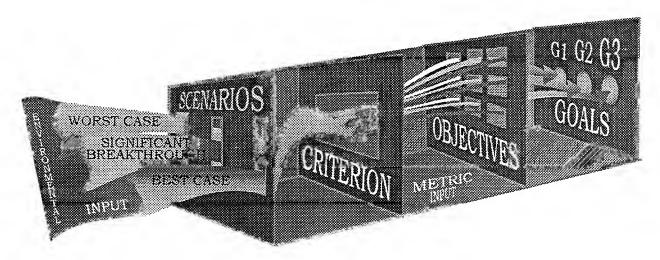
THE GAP ANALYSIS PLANNING MODEL

Using the same planning synopsis from the Environmental Analysis, subordinate organizations can develop their objectives and goals.



INFORMATION INPUTS TO THE SCENARIO

The first step is to brainstorm three potential scenarios using the planning synopsis (macro elements) and data from individual experience factors (micro elements). Each scenario uses these factors to develop their picture of the future for their organization. On an optimum level three separate planning groups will be used to construct an independent scenario using the Environmental Analysis synopsis (macro elements) and their own experience factors (micro elements). The three scenarios will illustrate the best case interpretation of the data; the worst case interpretation of the data, and a scenario incorporating potential breakthroughs.



Using the planning factors (which elements will most likely be available/where shortfalls are most likely) will produce the criterion to apply to the consolidated scenario. A brainstorming session with representatives from the three planning groups provides an effective medium for criterion development. When this criterion is applied to the "most likely" scenario, specific objectives and associated metrics can be identified and developed. Review of these identified objectives will show they grouped in specific subject areas that will, in turn, identify significant goals. It should be noted that this process is a growth process from the abstract to the specific. Unlike conventional management theory the goals evolve out of the objectives.

Review of the subordinate goals developed in this manner will reflect the degree of support for the strategic goals developed by upper management (next higher organizational level). These areas of congruence provide validation for both strategic and subordinate goals. When a high degree of congruence is identified, it indicates a well written, comprehensive Environmental Analyses and a healthy communication system between management levels.

Variance between the goals of the two levels constitutes the identification of "gaps" and the requirement for gap analysis. The differences identified in this process are usually the result of at least one, if not both of the following reasons:

- 1. An inadequate Environmental Analysis synopsis will leave areas of concern open to conjecture and interpretation outside the limits of the analysis. The result will be variances in the macro information inputs to the scenarios. The weaker the synopsis the greater the interpretive variances required to fill the vacuum.
- 2. Perceptual differences that result from less than open communication will cause bias in the micro elements during the scenario development. The basic cause of this bias is the perceptual influence on the knowledge base as each individual applies their experience factor.

Correcting the causes of the gaps will strengthen the process and the subsequent strategic planning cycles as each input provides next higher organizational level with validation of their process and a basis for the next planning cycle.

In Search of Non-financial Performance Measures



Capt Wayne Berg



Capt Laura Campbell

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Captain Laura Campbell is a transportation officer currently assigned as the Quality Advisor for the Directorate of Operations and Transportation, Headquarters Air Mobility Command, Scott AFB. She is a certified Quality course instructor and facilitator. Captain Campbell is the former Chief of Quality Support for Headquarters Twenty-First Air Force, McGuire AFB. She's been assigned at Cannon AFB, Kunsan AB, Charleston AFB, and Riyadh Saudi Arabia. Captain Campbell received her Masters in Management from Webster University.

In Search of Non-financial Performance Measures

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Chief, Aerial Port Information Management Division
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ABSTRACT

Typically, performance measures fall into one of two categories; financial and non-financial. As the name implies, financial measures tend to relate performance to budgets, revenues, and/or returns on investment. When measures are used that have no monetary relationship they can be called non-financial performance measures. Non-financial performance measures tend to focus on customer satisfaction and productivity issues that are not as readily quantifiable. Nonetheless, in a Quality environment these non-financial performance measures may be equally or more important than the financial "bottom line," particularly in the public sector. In recognition of this, four mechanisms are offered for use in portraying atypical non-financial performance in a quantitative fashion; unique measurement units, ratios (proportions), matrices, and gap measurement.

INTRODUCTION

Non-financial performance measures (NPM) are not new. The aerial kill ratios of the Korean Conflict, the body counts of Vietnam, and the more recent strategic airlift statistics of DESERT SHIELD and DESERT STORM all emphasized output effectiveness over efficiency. In day-to-day operations there is also a demand for performance measures that are not baselined to budgets or financial relationships. Often these measures must be drawn from vaguely related events, ill defined data bases, or subjective sources that seem too "touchy feely" to be of objective value. As once stated by Lazarus Long, "If it cannot be expressed in figures; it is not a science; it is opinion." Therein lies the challenge--to employ the standard tools of the quality trade in a disciplined and logical manner to draw solid conclusions and useful insights from data not easily quantified.

RECOGNIZING NPM

Part of what makes NPM so elusive is that they often deal with the least quantitative aspects of the quality information picture we are trying to assemble. They tend to focus on customer satisfaction and productivity issues (Thibodeau, 10). What's more, these focal points often compete with one another.

The customer's thirst for satisfaction, whether it be base housing maintenance or timely delivery of cargo via airlift, frequently runs contrary to the diverse capability of the suppliers. For example, the base housing tenant may believe the productive output of the Civil Engineering Squadron (CES) should be structured to maintain heating and plumbing services. However, the productive output of the Civil Engineers may also include a readiness capability for Prime BEEF, a cooperative training mission with reserve units, and maintenance of war reserve materials (WRM) for use with altogether other units. In this case, NPM will have to reconcile the four divergent productive outputs.

It should go without saying that the NPM must be useful in measuring outputs in a fashion that allows a "result oriented" disposition of effort and resources. The unlicensed aggregation of data does not create an NPM. Nor will a jumble of neatly presented facts and details automatically lead to foolproof solutions or conclusions.

STICKING TO BASICS

You may be tempted to ask "what quality tools apply to NPM?" The answer is simple--all of them. The key is to stick to the steps of measurement development, keeping in mind that this measurement effort is part of the continuous improvement process.

Measure only "key processes."

Is it a critical process or a lesser sub-process (separation of Jouran's "vital few" from the "useful many)? Can you identify a clear relationship between the process, your organizational plan, and mission? Don't exempt yourself from these considerations because you perform processes which are buried within larger processes -- the same rules apply, because you are the macro-level to yourself. Similarly, your mission may be so divergent that you have a number of key areas that just seem so unrelated that you question your own selection of what to measure. Just remember, if they are a critical part of your mission output, they are indeed processes you should seek to monitor through some form of measurement.

The attributes of good indicators are unchanged.

As mentioned previously, NPM can be quite difficult to determine, which makes following the standard guidelines for creating good measurements even more important. Are they simple and easy to understand? Are they meaningful to the customer? Do they use acceptable standards of data collection that can be repeated or duplicated by an audit? Is the data economical to collect? Is the "catch worth the chase?" Are they timely or too historical to affect process improvement? (AMC, 1-7)

You must have consensus and buy-in.

Obviously, you are measuring your processes with the intentions of improving or validating your output. Just as obviously, you want changes to be implemented wholeheartedly and smoothly, and your validations to be readily accepted and agreed upon. As in most other quality

endeavors, you can most easily overcome the resistance to change and ensure consensus with results by cultivating "buy in" from the very beginning of your effort.

This situation is particularly true of NPM. With financial performance measures, people have less trouble accepting half of the picture because they are conditioned to accept budget inputs and accounting data as a "given." But with NPM, especially when comparing subjective data, there tend to be fewer "givens" that are readily accepted. It becomes increasingly important to have upfront "buy-in" when dealing with unfamiliar data or information that must be internalized to a greater extent than normal because it lacks those "given" elements.

Fortunately, this can usually be accomplished by using teams or keeping as many players as possible in the information loop (AMC, 1-9). In this sense, when thinking NPM, also think about your strategic planning. Working with NPM, or any other measurements, isn't done in isolation. You'll want to capitalize on the "buy-in" cultivated during training, process improvement, or strategic planning to reinforce your NPM and vice versa. Likewise a disjointed measurement or strategic planning effort can <u>cost</u> you "buy-in!"

EMPLOYING NPM

Because you are measuring, you will need to develop some quantitative version of your data. The traps to avoid will be aggregating "apples and oranges" and drawing conclusions that lack credibility or expect too much of a "stretch" to achieve "buy-in." Four potential methods of avoiding these traps are to create unique measurement units, develop ratios, use matrices, and measure the gap. It is one thing to compile dissimilar data and present it unlabeled as stand-alone fact. It is another to merge dissimilar data into logically labeled measurements units using some form of weighted common denominators. The former is not measurement, while the latter is.

Unique Measurement Units

Obviously there will be specific measurements that you will be limited to. Unavoidably you will have to relate your productivity in standard hours, miles, feet, metric units, or base 10 numbers. But we are also accustomed to routinely using combinations of these measurement units in the course of daily activities, i.e. miles per hour, etc. Similarly, deriving NPM can be aided by creating measurement units unique to your productivity.

Let's look at an NPM in the transportation world that merges dissimilar information in such a way that we create a unique measurement unit. The challenge was to depict transportation capability in such a way that distance could be captured as the key variable. After all, the ability to fill a truck or aircraft was one capability, but the recycling of that capability was a factor of how long that vehicle was in use before it could be reused, which of course is a factor of how far its initial load had to be moved. The solution was the development of an NPM called "ton/miles." This measurement depicts productive capability in a fashion useful to a transportation specialist and customers by assimilating the output which means the most to each — how much can they move how far. You will note that it also meets all our criteria: 1) It is not a financial measure based on a budget or accounting database; 2) it measures productivity; 3) it is built around a key "mission" process, i.e., transportation capability; 4) it encompasses all the attributes of a good measurement; 5) it readily solicits buy-in because it is derived from recognizable and manageable data. This NPM not only reflects the capability that can be offered, but, when calculated in

reverse, reflects the capability needed to move specific tonnage. Subsequently, this NPM has proven useful not only as an output measure, but as a planning tool as well. Similarly, the commercial airline industry has developed a measurement called "passenger/miles" to satisfy much the same requirement.

Figure 1.
Transportation Capability (Ton/Miles)

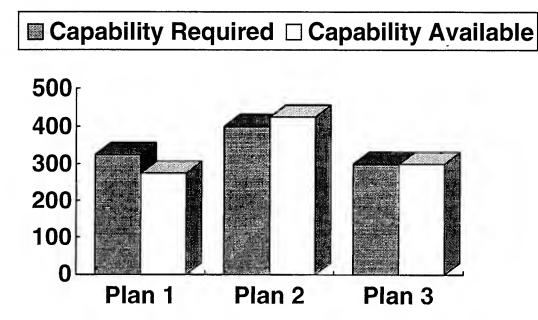


Fig 1. This chart depicts the transportation capacity needed to move specific tonnages specific distances based on particular plans, allowing a comparison of how the same finite pool of transportation assets will be able to support the different requirements of each plan.

Ratios

Ratios (or proportions) are another way to quantitatively develop relationships between dissimilar or subjective data. They are a statement of comparison between two numbers (Emanuel, 7). Using ratios, it is not necessary to aggregate data into a single number, because the importance resides in recognizing the relationship between data. For example, if you needed to measure the output of a vehicle maintenance unit relative to their combat capability, it may be necessary to look at both their combat and support vehicle in-commission status. One bad option would be to add all the in-commission status's together, i.e. 20 in-commission vehicles. However, if 18 of the 20 are support vehicles and only 2 combat vehicles, no measure of mission capability would have been derived. In this case, there is an obvious relationship between the types of vehicles and the resulting mission capability. A better NPM would be to develop a desired mix of support to combat vehicles that ensures mission capability, i.e., 1 support vehicle to every 1.5 combat vehicles. This new NPM and the resulting ratio (proportion) of 1:1.5 have now encompassed the dissimilar data into a productivity measure that has value in terms of mission accomplishment (Fig 2). The same is true of subjective data. The receipt of 50 negative survey

results is of minimal value unless it is tempered with the number of total inputs received. If only 50 negative results were received relative to 100,000 inputs, the ratio (proportion) of 50:100,000 (or more appropriately 1:2000) now has value. (This is particularly significant because human nature tends to skew customer feedback toward the extremes of very positive or very negative.) In each case, a positive or negative deviation from the desired ratio can be identified and interpreted as good or bad, then acted upon.

Figure 2. Ratio of Combat Vehicles to Support Vehicles

In-commission Ratio Goal - 1:1.5

Current Vehicle Status

Combat Vehicles In-commission 34

Support Vehicles In-commission 24

Current In-commission Ratio - 1:1.4

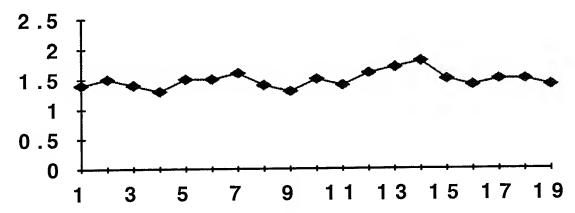


Fig 2. Deviations from the desired ratio can be monitored over time and plotted as a visual trend of performance.

Matrices

A matrix is commonly thought of as just a table of data. In fact, a matrix is actually more of a mega-ratio made up of individual relationships that are typically woven into a table format for easier understanding. It is a legitimate NPM because it, too, meets our previously stated criteria while reconciling a larger number of divergent key processes (Baghoni, 16). As an example, let's return to our original scenario of a civil engineering unit with the widely varied responsibilities of base housing maintenance, Prime Beef readiness, training and WRM. Due to the limited resources typically found in any unit, the engineer's ability to meet each customers expectations are related due to the overlapping skills required, the finite number of hours in the work week, and an equal responsibility to satisfy each. By researching the types of work orders received and the specific tasks associated with readiness, training and WRM we can ascertain our ability to

meet each need by looking at the skills we have available in our workforce. Applying the workforce necessary to accomplish 100% satisfaction in each area respectively would equate to the options available. We could take this example to varying degrees of detail by calculating satisfaction at 99%, 98%, etc. Arranging our findings in table form creates a matrix that quickly reveals the tradeoffs between emphasizing one process over the other. We can then use this information to apply resources against each responsibility in a mix that would provide the optimal results. We could also expand on this insight to determine which skill, when increased or decreased might have the largest positive or negative impact, and provide extra focus on maintaining or securing that particular skill. An NPM of this nature often creates visibility into the "process" that an output measure won't.

This rudimentary matrix procedure provides the basis for some very complex variations such as the Quality Function Deployment (QFD) matrix. The QFD expands the comparison process to four parts applicable to the strategic planning process: **what** you want to accomplish; **how** you might do it; determining the strength of **relationships** between the whats and the hows; and, establishing **targets** for each of the hows (Day, 603). However complicated you choose to make the matrix, its core viability as an NPM retains its value if the "basics" mentioned previously are adhered to.

Figure 3. CES Capability to Meet Need Matrix

	Housing	Training	Readiness	WRM
Option A	100%	80%	70%	50%
Option B	90%	100%	70%	100%
Option C	80%	95%	80%	95%
Option D	85%	90%	100%	75%

Fig 3. The ability of CES to meet competing requirements with the existing workforce by emphasizing one process over the others can be demonstrated in a matrix that shows the relationship between the outputs in terms of the percentage of the task completed.

Measuring the Gap

Another NPM method useful in measuring customer service is gap analysis. Specifically, measuring the gap answers the question, are or are you not providing value to your customer. The resulting chart also gives you the ability to know the degree of variance. Basically, this analysis measures, from the customer's perspective, the gap between expected service and the actual or perceived service (Wilson). This is generally done by the use of a service survey instrument which focuses on the key elements your organization has defined as being "value" products to your customer. For example, if reliability is a critical value then questions of the following nature could be asked and values derived for your customer's expectation's and perception of your reliability.

Expectation: "It is important to me that when the vehicle maintenance shop promises to do something by a certain time, they do so."

1 2 3 4 5 (6)

Perception: "When the vehicle maintenance shop promises to do something by a certain time, they do so."

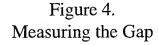
1 2 3 (4) 5 6 7

Note: () indicates value selected by the customer.

The formula for determining the number to be used on the gap analysis chart is (Wilson):

Perception - Expectation = Score
$$4(P) - 6(E) = -2$$

The next step is to measure the "gap." For each critical customer value area a bar is constructed based on the value score arrived at through the sets of survey questions. If the bar is above the zero line it indicates the service you are providing is, in fact, of only limited value to your customer, even though you are performing it very well. First, this would indicate that you have misidentified the values actually critical to your customer. Second, that you could now redirect some of the resources (people, time, money, etc.) away from the processes that create reliability and still satisfy your customer. Conversely, if your bar is below the zero line the indication is that it is important to your customer and you are not doing it very well. This should cause you to apply more resources to improve the process of reliability. If your bar falls on the zero line then you are achieving the correct blend of resources as applied to the processes that produce the value of reliability to your customer. This simple tool allows you to quantify aspects of customer service often hard to define or capture, but certainly an NPM worthy of measurement.



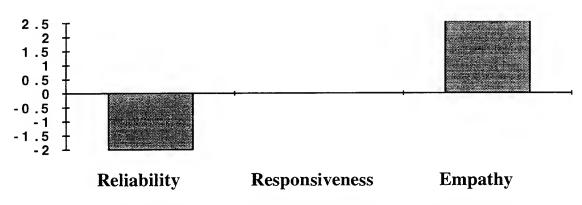


Fig 4. This chart depicts clearly the difference between the customers perceived and expected values relative to this organizations critical service factors. Note that the absence of a deviation from 0 in "Responsiveness" is the desired performance level -- there is no gap (Wilson).

CONCLUSION

The emphasis on performance measurement and results will continue to proliferate now and in the future. Many of our existing measures were adopted in part because they represent "things" we have always looked at and are, for the most part, quantitative. They tend to focus on end results and not performance of the process itself. As the measurement and process improvement relationship becomes more entrenched and familiar to us, many of us dealing with "subjective" products will use NPM as the means to monitor our critical process "products" and improve them. The use of unique measures, ratios, matrices, and gap measurement, along with a systematic approach to measurement development, and an understanding that subjective processes can be measured, will become a more understood and widely used method of measurement.

WORKS CITED

- Air Mobility Command, Directorate of Quality, <u>Quality Improvement: Measurement</u> (Scott AFB IL: HQ AMC, 1992)
- Baghoni, Ashok, PHD. "Non-Financial Performance Measures: A Top Down Framework." Presented to HQ Air Mobility Command. Scott AFB IL, 10 Mar, 1994.
- Day, Ronald G. "Put "Quality" in Your Business Plan: Use the QFD Matrix Concept to Insure Focus." Excerpt from the ASQC 48th Annual Quality Congress Proceedings, 1993.
- Emanuel, Edward E., "Preface to SQC." The Quality Alert Group 1989: 7.
- Thibodeau, Robert, PHD. "Non-Financial Performance Measures Project." Presented to HQ US Transportation Command. Scott AFB IL, 22 Feb, 1994.
- Wilson, Rosalie R., MA. "The Framework of Measures for Improving Organizational Performance." Presentation during Performance Measurement and Monitoring in Government Seminar. Washington, D.C., 13-15 Apr, 1994.

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Methodology and Tools for Conducting a Quality Air Force Assessment



Lt Col D.M. Reed

Lt Col Reed first became involved in "TQ" in 1990 as a facilitator-trainer conducting awareness and process action team courses. At AFMC's Phillips Laboratory, she focused training on implementing continuous process improvement models and developed a team process model for their assessment based on Malcolm Baldrige National Quality Award criteria. Moving to HQ AFOTEC, she initiated a second assessment using QAF criteria, and further refined her model through feedback and interaction with team members.

METHODOLOGY AND TOOLS FOR CONDUCTING A QUALITY AIR FORCE ASSESSMENT

Lt Col D. M . Reed Air Force Operational Test and Evaluation Center

Abstract: This paper provides a new methodology for team activity using the Quality Air Force criteria for unit self assessments. Through the use of process models progressing from general to detailed, this paper provides information on how to conduct a self assessment using a methodology that is efficient, easy to understand, and provides a common framework for category teams to integrate results into a final report. Some simple tools which support this method are included, as well as an overview of different categories of training which need to be conducted in order to have a successful assessment.

Conducting your Unit Self Assessment (USA) is a bit like eating an elephant: one bite at a time. If you've completed an assessment, you probably know some of the pitfails. But, do you know how you could avoid them next time around? If you are getting ready to start your USA, you may have a number of unanswered questions, such as hw to organize, where to start, and what the teams are supposed to do.

Before you begin, your organization must know what you are going to do with the results. The assessment will likely be, even in small organizations, a project which will consume significant resources. All personnel (from senior executives to secretaries) must understand that the assessment will be used to begin or add to existing improvement activities for the organization. The flow chart below is one way of displaying the use of assessment.

QAFA MACRO PROCESS BRIEF CONDUCT ASSESSMENT MEMBERS **EVALUATORS** SCORE 100s OF STRENGTHS & AREAS OF OPPORTUNITY BRIEF MEMBERS SELECT AREAS OF OPPORTUNITY IMPLEMENT REVISE STRATEGIC IMPROVEMENTS BUSINESS OR QUALITY PLAN RESULTS

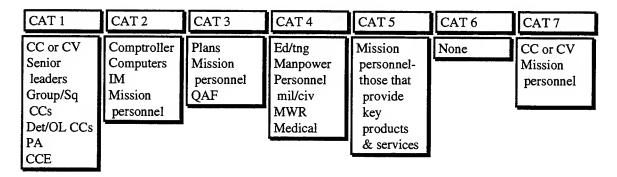
Once senior leadership has committed to conducting the assessment, they should receive a short (1-2 hour) briefing on the USA to provide them enough information to select the appropriate category leaders. The topics should be included:

- a. How the seven criteria build a strong organization
- b. Criteria is not prescriptive
- c. Macro process (shown on page 1)
- d. What the USA is and benefits to the organization
- e. Relationship of the categories
- f. Core values criteria are based on
- g. Brief overview of categories

Category leaders should next be provided training, but again, just enough to allow them to select team members with the right talents and knowledge. Use the same information as above, plus:

- a. Responsibilities of category leaders
- b. What makes a good team
- c. Team process (shown on page 4)

Keep the teams small! Three to seven seems to work best for group dynamics. You will be collecting a lot of data, but you don't necessarily need every "data holder" on the team. The table below is a suggested composition for teams, but don't relate number of suggestions to size!



Category 6 needs a team leader but not a separate team. Category 4 and 7 report their own results. All other categories **collect** their own results, and provide a team member to Category 6 to **report** those results. Doing this will solve one of two problems frequently

encountered in doing the assessment: lack of continuity between 1, 2, 3, and 5 and the results in 6; or the delay involved as Category 6 team members wait for good drafts from 1, 2, 3 and 5 to begin data collection.

This may also be a good time for the senior leaders to determine who, if not an IG team, will be the evaluators. The evaluator team should include senior leadership and mission personnel and be thoroughly trained. This is extremely important in order that the results of the evaluation—the strengths and areas of improvement—will be recognized as valid by the members of the organization. Future improvement activities based on unvalid strengths or weaknesses are doomed to failure. The findings of the evaluator team should "resonate" with the people in your organization. Knowledgeable personnel should look at the evaluator's report and say "Yep, that's us all right!"

This detailed assessment process flowchart below may be helpful in determining, at a more detailed level, what needs to be done.

DETAILED ASSESSMENT PROCESS FLOW 3 1 SELECT TRAIN CAT FORM/TRAIN CAT TEAM **LEADERS CAT TEAMS LEADERS** 11 **DESIGN/INTEGRATE** TEAM APPROACHES SELECT AREAS OF OPPORTUNITY FOR STRATEGIC 10 5 OR QUALITY PLAN RECEIVE COLLECT **EVALUATOR** DATA REPORT **1A** 9 6 SELECT/TRAIN **SCORE ANALYZE EVALUATORS** REPORT DATA INTEGRATE PREPARE

Once Category teams are formed, your assessment process officially begins. Training is the most important resource you can provide the category teams. If you can get AFQI training for all team members, by all means do so. If this is not practical, building your own training program around the criteria for each team is a valuable experience for an organization. Although it requires some up-front time, it will save your teams much training time. Why? Because the

REPORT

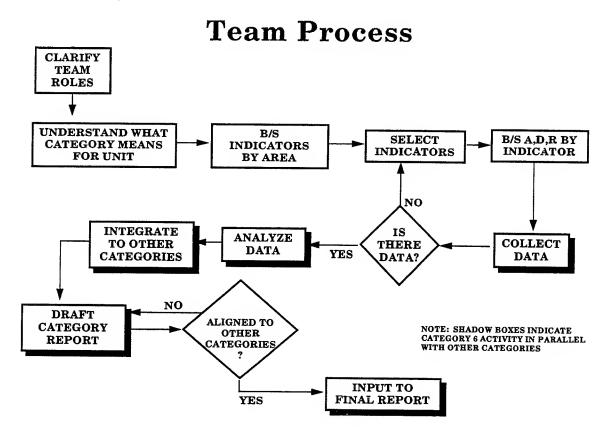
RESULTS

AFQI course is designed for QAFA evaluators, and covers material not needed by the team. Below is an outline of a half-day training course for teams:

- a. What the USA is, why we are doing it, how we are going to do it
- b. Approach, deployment and results
- c. Overview of categories and items, stressing interrelationships of team's criteria
- d. Team process
- e. Score case study
- f. Introduction of tools
- j. Report Preparation

Get your teams off to a good start by giving them the framework, knowledge and tools they need to do a good job!

What is critical, and largely missing, from training and models for self assessments, is a thorough explanation of what the team process actually is. The team process chart, with a brief explanation of the steps involved was constructed based on lessons learned from self assessments in two large organizations.



<u>Clarify team roles</u>. Team structure is very important for the duration of the assessment. Because an assessment may take several months, good team interaction is necessary for day-to-day management and to deal with absences of team members when they occur. Duties can be rotated or permanent to include leader, recorder, facilitator, and results coordinator. The results coordinator will ensure that results from the approach and deployment activities described in the criteria are reported in category 6.

<u>Understand what the Category means for unit.</u> No amount of training can provide the details of what the criteria means for a specific unit. This can only be done by unit personnel after an overview of the criteria has been presented. Teams should take time to thoroughly read and discuss the criteria. Avoid additional books, check lists, and guides which interpret the criteria.

Brainstorm indicators by area. Indicators are simply "things" that are the unit's answer to what is being required by the area. Use standard brainstorming rules for recording all ideas. Progress from one area to the next in sequential order. You will find that the number of indicators generally decreases as you go through the item by area, but when you have completed one item, see if many of the indicators found in the early areas are better suited to later areas.

<u>Select indicator</u>. The team can now select indicators to pursue. If you have a very large number, you may want to establish criteria for selection (ease of data collection, good results available, unclassified, etc.) of a few to collect data on. Three to five indicators per area should provide more than enough data, and one good indicator may be all you need for a strong response to an area.

Brainstorm approach, deployment and results by indicator. By this time your charts may be getting unwieldy, and you may want to consider using some of the forms provided in the tool kit. Team members should know before data collection begins whether to look for approaches, deployment or results. Remember, teams must collect results for all areas that contain a note stating that data/results should be reported elsewhere.

Select data collection method. Determine if you will collect the data by document search, interviews, surveys, etc. If you plan to do interviews, setting up an interview matrix may help divide the interviews logically. (See Indicator Matrix in tool kit for further information.) Surveys should be consolidated with other categories if at all possible. An integration meeting with all category leaders at this point will serve two important functions. First, to ensure everyone is working on the same level and using the same definitions of customers, key products and services, etc. Second, to increase continuity across categories. For example, showing a computer upgrade in response to a customer requirement (Category 7), supported and resourced by senior leadership (Category 1) with a good plan to integrate into existing systems (Category 2, 3) which then provides more accurate or timely information to the customer (Category 6) will be much more powerful than four pieces illustrating the same principles but using unrelated examples.

<u>Collect data</u>. At last! When the team has decided how to answer the area (indicator) and what to look for in approach, deployment and results, it's time to actually collect data. Again, forms and other tools will help collect and organize information in an orderly manner. If there is no data for an indicator use the other indicators selected for the area, or return to the original list of indicators and select a new indicator. As data begins to form an area response, a second meeting of category leaders should assure seamless integration of the final report.

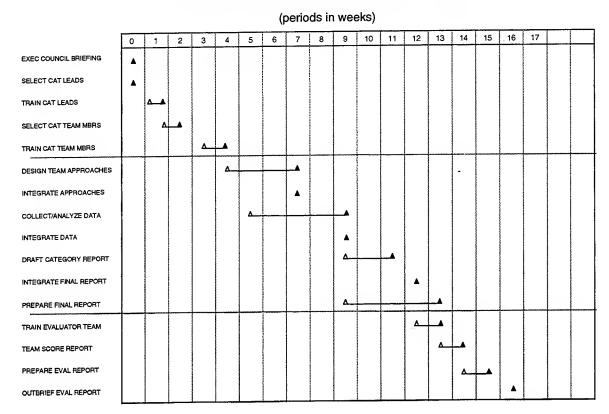
<u>Draft category report</u>. Provide information on page format and numbering, font and pitch, labeling figures and tables, etc. at this time. Writing the report is the responsibility of the category leaders. You will have seven authors as it is. Assigning items or areas to team members for writing increases the number of "authors" beyond the manageable level.

<u>Check alignment.</u> What's left now is to clean up references to other categories' text, figures, and labels.

<u>Final report.</u> This is the end of the team process and the beginning of the improvement process for the unit. Don't forget to celebrate and recognize team member and administrative support contributions.

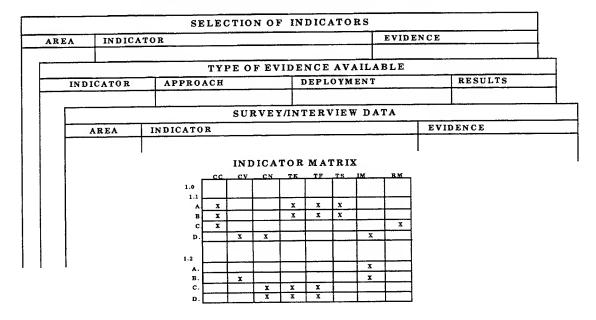
How long will the assessment take? The timeline on the next page provides just over three months to complete the assessment in a large organization, and provides evaluator feedback by the end of the fourth month. The size of your unit may alter the length of your actual USA, but the relative allocation of time remains the same. You will never have enough time to coordinate the draft report throughout the organization, so some form of milestones is useful in bringing the effort to a close.

ASSESSMENT TIME LINE



A small "tool kit" of forms provided to teams will make their job easier. The ones displayed below will help the team record its thoughts and activities as it uses the models provided in this paper.

Assessment Tool Kit



<u>Selection of indicators</u> is useful for recording the brainstormed indicators for future reference. By recording the evidence expected, the team knows what it is looking for before heading out.

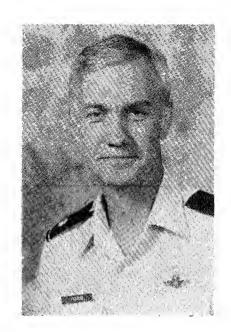
<u>Type of evidence available</u> serves two purposes. First, it reminds the team to distinguish between approach and deployment and reminds them that they are collecting results as well, either for their category or category 6. Secondly, and most obviously, this is where the meat of the final report will be drawn from.

<u>Survey/interview data</u> may refine the collection task in more detail.

<u>Indicator matrix</u> is an indispensable tool for organizing the data collection effort before descending on your organization. Many teams make the mistake of assigning data collection by item, without looking first to see if there is another, more logical way to do so. (In the sample data above, for example, it might be more logical for one team member to get 1.1d and 1.2a, b from IM rather than have two separate people approach IM for closely related information.

Get creative! Design your own tools for a successful USA. Good luck!

Metric Development



Lt Col Wayne Krause, Jr.

Lieutenant Colonel Wayne Krause, Jr., is currently the Chief, Quality Management and is responsible for the operations group (consisting of 8 squadrons – 2000 personnel) quality management program to include development and monitoring of training, goals/objectives, and metrics at Little Rock AFB, AR. He received his BS degree in business administration from the University of Nebraska in 1970 and a MBA from Southern Illinois University in 1974.

METRIC DEVELOPMENT

Lt Col Wayne Krause, Jr.

314 OG/QM

ABSTRACT

Metric information is an integral part of continuous process improvement. Metric information generated for each process can lead to an overdose of information; hence, it becomes imperative that a system be developed to provide usable data throughout the organization rather than just being usable for one subelement or process of the organization. This can be achieved through the development of a metric information system that can summarize data from the succeeding units into manageable levels of information that can tie the organization together as a cohesive whole. Weighted values can be applied to the metric information gathered to emphasize those areas whose metrics are of more concern or whose processes are more critical to watch. The summarized score is the data that is trended by the upper levels within the organization. This approach allows for a broader, more comprehensive view of the organization which, as well, reduces the potential overload of too much data/information at the different levels of command.

METRIC DEVELOPMENT

Through our training in quality we've learned that metrics are a necessary element for providing feedback on how well a process is performing. Hence, it becomes a given that metric information is an integral part of continuous process improvement. This can lead to a proliferation of data that is very hard to manage and understand particularly for those who are not dealing with the process firsthand. How can the metric information generated on each process be developed to provide usable data throughout the organization rather than just being usable for one subelement or process of the organization? One such possibility is the development of a metric information system that can summarize data from the succeeding units into manageable levels of information that can tie the organization together as a cohesive whole.

The organization through the quality process will integrate their quality system. Those processes found to be important by the upper levels of the organization are cascaded down into subprocesses to the succeeding levels of the organization. As well, the lower levels of the organization may have additional processes that need to be added. To provide a specific illustration, Fig 1 shows an Air Force wing model. Typical of any wing is a key process of providing some type of combat capability. The subprocesses at the group level would possibly be: combat training, manning (appropriate skill levels and experience), equipment/facilities, maintenance and procurement etc. At the squadron level these processes would be further subdivided to combat training in chemical defense, mobility, manning by specific position, etc.

ORGANIZATION PROCESS DEVELOPMENT

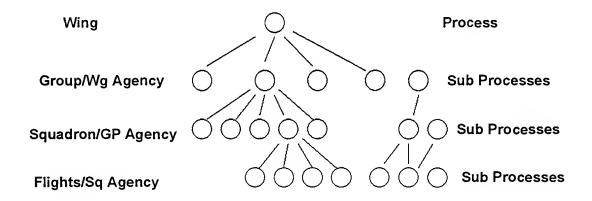


Fig 1

As the processes divide into subprocesses what should be measured and how does this information link together to bring the organization into an integrated whole? Fig 2 illustrates

again the dividing of the processes into subprocesses with the addition of the final level task (the point at which action is taken). It is at this point (task) that metric information will need to be collected. In many cases we now collect this level of metric information. Additionally, in many cases this information will be reviewed by many different levels of command. For example, airdrop scores may be reviewed by the crew member level (the task level of the organization) and on up through the wing level. At the task level the individual crew members are interested in each one of their drops and also their overall averages. But, as the scores are reviewed up the levels of the organization the importance of the individual scores becomes less and less significant and the averages of the scores and trends of the averages become more and more important. Process owners more removed from the tasks become more interested in how well the system is doing as a whole. Hence, a metric system that provides information to those accomplishing the task and then summarizes this data for the layers of command that have a broader process provides the type of needed information for the different levels of command. Through this process of summarizing the data the organization can collect vast amounts of information on all aspects of the activities accomplished by the entire organization. This allows the organization the ability to manage from an informed position on the entire spectrum of activities accomplished within and without the organization.

METRIC DEVELOPMENT

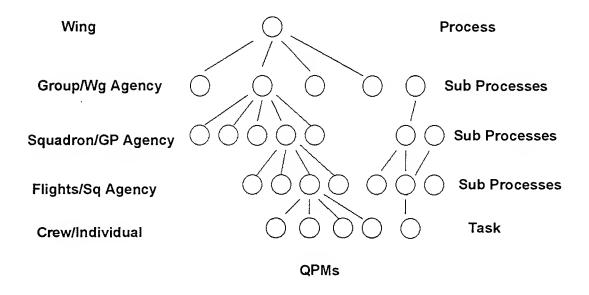


Fig 2

Taking the summarization process one step further, weighted values can be applied to the metric information gathered to emphasize those areas whose metrics are of more concern or whose processes are more critical to watch.

For example, using the previous example, subprocesses of the group's process combat training could possibly be assault landings, airdrop, chemical defense proficiency, joint training, etc. Fig 3 illustrates these subprocesses and their possible associated weights. By weighting the more critical subprocesses, in this case joint training, any changes in the more heavily weighted processes will cause more significant changes in the overall score. The overall score is then a summation of the weighted values times the associated index percentage which is summarized in the last row in Fig 3. It is this summarized score of 708 for combat training that the Operations Group would trend, not all the others. Yet the subprocesses and the associated metric indexes would be of vital interest to the squadrons, and crew members.

Subprocesses	value %	weight	weighted value
assault landings	85	100	85
airdrop	78	200	156
chem defense	89	300	267
joint training	50	400	200 .
<u>PROCESS</u>			
COMBAT TRAIN			708

Fig 3

Hence the squadrons would trend and follow all of the indexes whereas, the operations group would only trend and follow the overall score. By accomplishing this summarization the operations group in this case can follow how well the squadrons are accomplishing their task (assault landings, airdrop, chemical defense, and joint training) through one index score for combat training. Again taking this one step further one can see in Fig 4 that other processes can be added that encompasses all of the aspects of the operations group. Not only could combat training processes be followed but, as well, maintenance, flying hours, individual fitness (fitness pass rates and weight standards) etc. could be tracked without having to look at each specific index. Hence, as illustrated in Fig 4 a weighted summary could be developed that allows the group to monitor the numerous processes with one overall score (deploy/readiness). In turn this operations group metric of deploy/readiness would be given to the wing along with the other groups to provide information for the wing's process of combat capability. This procedure gives the upper levels within the organization a comprehensive approach for monitoring all the sub indexes. As well, this approach minimizes the amount of data the upper levels of the organization have to deal with while the task levels of the organization are able to look at the detailed information needed to provide corrections to their processes.

DEPLOY / READINESS PROCESSES

		WEIGHTED VALUE
•	MANNING	525
•	MAINTENANCE SUMMARY	400
•	DROPPED OBJECTS	40
•	AIRDROP	245
•	CHECKRIDES	120
•	CONTINUATION TRAINING	110
•	FLYING HOURS	110
•	GROUND TRAINING OVERDUES	45
•	MAINTENANCE TRAINING	35
•	FITNESS TRAINING	65
•	WEIGHT STANDARDS	<u>65</u>
	 MAXIMUM TOTAL 	2200

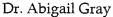
Fig 4

The summarization process can however, cover up problem areas. This process aggregates many areas hence, one sub metric maybe trending down while another maybe trending up thereby canceling (off setting) each other and giving an overall appearance of consistency. This problem can be countered through the use of leading and lagging indicators. Each sub metric would be highlighted if it becomes a leading or lagging metric. Another counter would be to highlight those sub metrics that fall outside of their control limits. By highlighting the problem areas for the sub metrics the summarization process can avoid the pitfall of glossing over details that could be indicating a potential problem.

This approach achieves the consolidation of metric information by summing and aggregating the information from the task level into broad based metric data that ties the organization together through the cascading network of processes and subprocesses. Unless the organizational unit is accomplishing the task the unit is only looking at summarized indexes. The summarized score is the data that is trended by the upper levels of the organization allowing for a broader, more comprehensive view of the unit. Since the upper levels in the organization are only working with summarized data this approach reduces the potential overload of too much data/information at their level. Yet, at the task level of the organization there is the necessary detail that its needed to provide information for corrections to their processes. This approach therefor provides a powerful tool that allows the various levels of command feedback that is appropriate to the process at their level.

Quality and Chaos: Complement or Controversy?







Maj Todor Tagarev

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Major Tagarev is a student at ACSC in the class of 1994. Upon graduation from Bulgarian Air Force Academy in 1982, he received his commission in the Bulgarian Armed Forces and his graduate degree in Automatics and Telemechanics. From 1982 until 1986, he served as a weapon systems maintenance specialist. From 1986-1989, he was a postgraduate at the Air Force Engineering Academy "N.E.Joukovsky", Moscow, Russia. After the defense of his dissertation, he served as a lecturer at the Bulgarian Air Force Academy. In 1991, he was appointed Deputy Head of the Scientific Research Department at the Academy. Prior to his study at ACSC, major Tagarev worked as a military education specialist for the Personnel Department of the Bulgarian Ministry of Defense. Major Tagarev has over twenty publications in systems' control.

QUALITY AND CHAOS: COMPLEMENT OR CONTROVERSY?

Abigail Gray, Ph.D. and Major Todor Tagarev, Ph.D. Air Command and Staff College

Abstract

In this study the authors examine major concepts of the new science of chaos, discuss the existence of chaos as an intrinsic feature of wartime and peacetime Air Force activities, and propose means by which chaos and quality may effectively coexist so as to advance organizational effectiveness and member satisfaction. Chaos and quality are not controversial terms, but complementary concepts, sharing a holistic approach to understanding organizational cultures, seeking themes and patterns rather than isolated causes, focusing on direction and vision instead of tight control, allowing initiative, and decentralizing information. Chaos theory provides not only new exotic terms, but also concepts and tools that we can implement in our everyday life to achieve quality.

Introduction

In order to thrive in a world of change and chaos, we will need to accept chaos as an essential process by which natural systems, including organizations, renew and revitalize themselves.

("Leadership and the New

Science")

In 1987, Tom Peters suggested to us that, as organizational members, our true objective should be to take chaos as given and learn to thrive on it. While Peters embraced chaos, he did not define the phenomenon or suggest how it is best examined. As readers, we were challenged to accept the inevitable - the only certainty is change, the only stability is chaos, the only fact is myth. This vacillation between contradictory poles, this manifestation of interplay, creates the opportunity for a new synthesis. As Peters explains:

The winners of tomorrow will deal proactively with chaos, will look at the chaos per se as the source of market advantage, not as a problem to be got around. Chaos and uncertainty are (will be) market opportunities for the wise; capitalizing on fleeting market anomalies will be the successful business's greatest accomplishment. (xiv)

Both Peters' and Wheatley's (1992) references to chaos invoke a challenge of tremendous proportion. The irony is that to "deal with" and "look at" chaos, as Peters' suggests, presumes that we can be separated from it. Peters', in effect, reflects the dualistic nature of Western thought. Those of us raised in a Western culture are less sensitized to thinking in terms of the dialectic of opposites. We need look no further than our language. While Western language tends toward either/or polarities, Eastern languages more often approach both/and. To move beyond our cultural frames and to perceive the unity of opposites is to bring fresh insight into organizational and interpersonal life. If we are to understand and advance organizational life, we must move

from the dualistic to the dialectical. To do this, we must do more than thrive on chaos. We must *understand* chaos.

There is no doubt that we live in a world shrunken by technology's unsettling impact, a world in which we face the challenges of downsizing, merging, and de-merging, a world of unprecedented uncertainty that challenges Air Force leaders to achieve extraordinary responsiveness, pursue innovation, achieve flexibility through empowerment, and embrace change while implementing quality. There is no doubt that Air Force leaders face the challenge of changing the Air Force structure while sustaining deterrence, providing versatile combat capability in a likely lethal environment, supplying rapid global mobility, controlling air and space, and sharing knowledge and experience with US counterparts in the newly democratic states. The doubt arises when we examine the relationship between chaos and quality in Air Force organizational culture. Can there be quality in chaotic organizational cultures? Can we implement quality initiatives through chaos? Are quality and chaos complementary or contradictory?

These questions are not easily answered. The greatest philosophers of our time have posited and continue to speculate the nature of organizations and their role in society. Philosophical perspectives and positions cross disciplinary boundaries. This study is yet another attempt to advance the body of Air Force knowledge by further challenging the assumptions inherent in chaotic organizational cultures, exploring the nature of the relationship between chaos and quality, and expanding the scope of philosophical and theoretical boundary-spanning in interdisciplinary arenas. The authors examine major concepts of the new science of chaos, discuss the existence of chaos in select wartime and peacetime Air Force activities, and propose means by which chaos and quality may effectively coexist so as to advance organizational effectiveness and member satisfaction.

Chaos Theory: An Overview

The common dictionary definition of chaos as "extreme confusion or disorder" is different from the technical use of the word. Scientists of the new and rapidly developing chaos theory have not reached agreement on defining chaos. The term, however, is usually used to denote the dynamics of a phenomenon and/or a deterministic system in which the temporal evolution is aperiodic in time and sensitive to the initial conditions. Other definitions stress the "apparently random recurrent behavior in a simple deterministic system" or "the irregular, unpredictable behavior of deterministic, nonlinear dynamical systems" (Gleick 306).

For the purposes of the current paper the authors examine basic notions from chaos theory, namely that chaos is descriptive of the dynamics of a system, it denotes \underline{a} type of possible behavior of a system, it supposes high sensitivity upon initial conditions, it denies long-term prediction of the state of the system while allowing prediction of patterns in the behavior, and it generates fractal structures.

Dynamic systems differ from one another in the way they change with time. Linear systems can exhibit convergence to a stable equilibrium or unstable divergence.

Additionally, nonlinear systems may display stable oscillations or chaotic behavior. It is important to point out that a nonlinear system may exhibit varying types of behavior and, though the term 'chaotic' is often applied to a 'system,' it describes a type of behavior.

Chaotic systems are nonlinear. For a system to be linear, it must meet the conditions of proportionality and additivity. The central concept of linearity is that the whole is equal to the sum of its parts. This allows a problem to be broken up into smaller pieces, and the solution of the original problem to be found by adding the solutions of the pieces. Nonlinear systems disobey the rules of proportionality and additivity. In such systems the whole does not equal the sum of the parts and synergistic interactions may lead to disproportionally large outputs, erratic behavior, and extremely high sensitivity to the initial conditions.

Among the reasons for nonlinearity are the nature of the decision-making process (Richards), the presence of feedback loops, delays in the decision-making cycle and the execution, the nature of the interactions among the elements of the systems, etc. As the authors will demonstrate, these features are present in the activity of the AF in wartime, as well as in peacetime.

If a deterministic system exhibits either convergence to a stable equilibrium or stable oscillation, its future is predictable. The future state of a random system, however, is independent of the current state and can be characterized only in terms of probabilities. A chaotic system is (at least partly) deterministic. That is to say, given a knowledge of the current conditions, one must be able to predict the future changes. The high sensitivity of chaotic systems to current conditions, however, does not allow long-term prediction, because even infinitesimal differences in estimating the initial conditions eventually cause large changes in the system behavior. Fortunately, there are bounds to this unpredictability. Chaos theory provides tools for prediction of patterns in future behaviors and for defining the bounds, specific to each particular system, within which the system behavior is unpredictable. These bounds are formally referred to as an attractors--i.e., the specification of the phase space within which the system evolves (Richards 222).

Unlike a point for stable equilibrium or a closed curve for stable oscillation, the phase space representation of an attractor for a chaotic system has complex fractal structure. This attractor, commonly referred to as a strange attractor, never intersects itself. Its loops are infinitely deep, but never join. Yet they stay inside a bounded region of phase space.

The fractal structure of the attractor means that a chaotic system looks the same when viewed from different distances. Two conditions must be true for systems to scale in such way (Tagarev et al. 70). First, the same laws, rules and variables must be present in the system at both the large and the small scale, and second, the elements of the system must exist in continuum. This self-similarity means that patterns, found at one scale (level), exist also in another scale.

Numerous examples of chaotic behavior are found in weather patterns, biological population dynamics, fluid dynamics, and other natural phenomena (Gleick). It seems,

therefore, that chaos in nature is the norm rather than the exception. More important for our study, however, are examples of chaotic behavior in both controlled and natural decision making processes (Richards), in the functioning of a government agency (Kiehl), and in historical data related to warfare. This new evidence relates to the functioning of the Air Force in wartime, as well as in peacetime.

Chaos and the Application of Air Power

In the twentieth century the use of aerospace power became an intrinsic part of warfare. As such, the application of air power is influenced by people's experience, beliefs, vision, but most of all, by the very nature of war. Clausewitz was one of the first theorists to grasp and express the nonlinear nature of war. For him, "the interactive nature of war produces a system driven by psychological forces and characterized by positive feedback" (Beyerchen). The relationship between the political aim and the military means "...clearly does not work in a linear fashion. The constant interplay is an interactive, feedback process that constitutes an intrinsic feature of war" (Beyerchen). The Clausewitzian "fog," "friction," and chance are inherent in war and cause unpredictability.

The dynamism, nonlinearity, and unpredictability of war support the thesis that chaos is present in warfare. A recent study at Air Command and Staff College (Tagarev et al.) applied several qualitative and quantitative tests for identification of chaotic behavior in historical data related to war. The authors analyzed several data sets, among them US aircraft losses during the Vietnam war, and reached the conclusion that chaos is present in warfare. In this paper, the authors prove the presence of chaos in the conduct of the "Battle of Britain" (Hough 357-370). Figure 1 represents the time dependence of the German and the British losses for the duration of the campaign. Figure 2 represents the estimated correlation dimension versus the embedding dimension for both data sets.

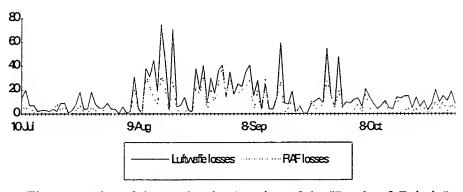


Figure 1. Aircraft losses for the duration of the "Battle of Britain"

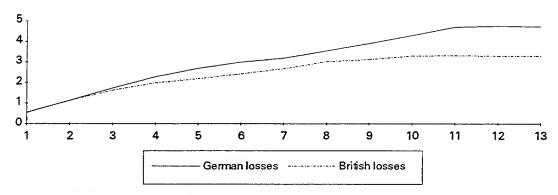


Figure 2. Estimated correlation dimension for daily Luftwaffe and RAF aircraft losses in the "Battle of Britain"

The time dependence of both the Luftwaffe and the RAF losses has a nonperiodic ragged appearance, which is a qualitative sign of chaos. The presence of strange attractors is supported by applying Grassberger-Procaccia algorithm (Grassberger) to the time series. With the increase of the embedding dimension, the estimated dimensions converge to 4.7 for the Luftwaffe losses and 3.3 for the British aircraft losses. For both data sets the estimated dimension is low and fractal. This is a clear sign of the presence of strange attractors and describes chaotic behavior in the application of air power on the operational level of war.

Chaos and Organizational Activity

In both wartime and peacetime, Air Force organizations, like most organizations, are *dynamic* and constantly changing due to technology, internal network changes, and external organizational changes. As such, organizational theorists suggest that organizations do not lend themselves to linear analysis. Why? One reason is that communication and culture are the vehicles through which reality is constituted in organizational life. Further examination of these two primary organizational components reveals deficiencies in a linear analysis of organizations.

It is a widely held belief among communication scholars that communication is <u>the</u> organizing element within organizations. According to Weick:

Communication underlies most organizational processes, contributes to both the development and the enactment of structures, and is shaped by a number of organizational and individual characteristics, including size, department, autonomy, and upward aspirations. Without communication, organizing could not occur. (42)

Communication must therefore be examined "...not as a process occurring between any sender of messages and any potential recipient, but in relation to the social system in which it occurs and the particular function it performs in that system (Katz and Kahn 429). Linear analyses of organizations view human communication as a transmission process (i.e. sender-channel-receiver). Further, linear analysis approaches communication concepts as quasi-causal, organizational functions as transitive, communicative messages as materialistic, and organizational systems as reductionistic.

In like manner, organizational cultures must be examined through a perspective that conceptualizes organizations as socially constructed, investigates the symbolic nature of management, and focuses on processes that occur across levels of analysis. Linear analysis of organizational cultures does not approach sharing of meanings, norms, and values; the emphasizing of people, ideas, and action; or the focusing on processes rather than goals.

A recent study of linear systems revealed that they are rational in stable environments but irrational in unstable environments (Weick 108). Linearity in organizations promotes cultures in which communication flows along the lines of authority and control, information exchange is mostly vertical (i.e. superior to subordinate), and organizations tend to be efficient, but relatively weak in innovation and morale. In sum, definition and dependence prevail--creating a culture in which the world view is limited, stereotypes are maintained, competence is overestimated, and the disappearance of "the advantage" goes undetected.

The study of human behavior in organizations suggests that culture is "built on the edge of chaos" (Rosen 48). In our exploration of nonlinearity, we further find "patterns which connect" (Bateson) and underlie diversity in organizational life. The existance of patterns and nonlinearity in organizational life are characteristic of chaotic systems. As human beings striving to understand a chaotic world, we hold onto what we know--that certain patterns perceptually reoccur when we examine the behavior of others. Why is this unit of analysis (i.e. individual perceptions) of concern? Downey and Slocum respond as follows:

This perceptual view of uncertainty raises the issues of how organizations relate to uncertainty. Zaltman, Duncan, and Holker (1973), while discussing innovation, suggest that all those factors which influence individual perceptions directly or indirectly influence the organization's perceptions. The present authors would tentatively take this one step further and suggest that an organization's perceptions...are subject to these same individual influences because the organization's perceptions are a result of individual organization members. (qtd. in Jablin et al. 140)

To summarize, perceptual patterns arise in organizational activity because of human desire to "make sense" out of situations, organizational environments, cultures, and individuals. In a world of perceptual biases, sense-making mechanisms, uncertainty reduction, and compliance-gaining measures, we impose structure (both behavioral and organizational) and, perhaps more importantly, we impose meaning through communication. The imposition of structure and meaning through communication both creates and reveals patterns. Wheatley reasons, that such patterns exist at all levels of an organization, and that "the very best organizations have a fractal quality to them." If the Air Force is to be the "very best" organization, an observer should be able to tell what its values and ways of functioning are by watching anyone, whether an airman on the flight line or senior leader. As Wheatley suggests: "There is a consistency and predictability to the quality of behavior. No matter where we look in these organizations, self-similarity is found in its people, in spite of the complex range of roles and levels" (132).

The nonlinear nature of the functioning of the Air Force, the complex interactions among units from different levels, the existence of patterns and fractal structure, are features of chaotic systems. Qualitative reasoning, supported by the application of methods from chaos theory, strongly suggests that chaos is inherent in the Air Force activity in war and peace.

Chaos and Quality

The idea that 'chaos is good' first came from the natural sciences. For example, a chaotic mechanism of adaptability generates diverse behavior, prevents entrainment, and makes a biological system less predictable to a predator (Holden 10-11). Chaotic population dynamics generate self-consistency, increase evolutionary adaptability, and improve the chances of survival for biological systems (Holden 12). It has been suggested that a healthy state of a society will be in the transition zone between order and chaos (Waldrop 226). The question is, "How can we use this knowledge to improve quality in the Air Force?"

As we strive for quality in Air Force organizations by decentralizing information, exploiting opportunities, pursuing change, and communicating vision, we must remember that for change to occur, it must meet the organization's internal demands for coherence and the external requirements of the environment. The process will be recursive, and will generate (via communication) a meaning-centered structure and order characterized by fog, friction, and chaos. To survive, we must move beyond the structural and functional theories of organizations--theories which share the common premise that the world has a discernible structure and that the operations, behaviors, and actions (functions) accomplished in the world can be explained in terms of that structure (Littlejohn 34). We must remember that the acrobat on the high wire maintains his balance by continual correction of his imbalance. Control is the key to survivability.

Managerial efforts toward harmony, unity, continuity, and order require extraordinary effort. The imposition of structure coupled with the exertion of control enables the attribution of causality and responsibility while meeting the goals of decentralizing information and authority. The marriage of structure and control, however, may have negative organizational effects, depending on how control is accomplished through communication. Tompkins and Cheney (in Littlejohn 232) identify 4 processes by which control is accomplished:

- 1. Simple control: the use of direct, open power
- 2. Technical control: the manipulation of technology
- 3. Bureaucratic control: the use of organizational structure
- 4. Concertive control: the use of interpersonal relationships and teamwork.

Concertive control is central to a quality organizational culture. As Tompkins and Cheney explain:

In the concertive organization, the explicitly written rules and regulations are largely replaced by the common understanding of values, objectives, and means of achievement, along with a deep appreciation for the organization's 'mission.' This we call--to modify a phrase in current use--the 'soul of the new organization.' Concertive organizations display simultaneous 'loose' and 'tight' properties ... because members can be depended upon to act within a range of alternatives tied to implicit but highly motivating core values. (qtd. in Littlejohn 232)

"Tight structures" within turbulent organizations with an inherent chaotic nature stifle quality initiatives and decrease productivity. Bourgeois (1985), for example, found that when there is a poor match between true environmental uncertainty and top management's perceived environmental uncertainty there were lower levels of economic performance by organizations. With this in mind, complexity, turbulence, the routineness of problem-solution states, and information load have been extensively studied as they relate to perceived environmental uncertainty. Most studies reveal, as would be expected, that when greater amounts of information are communicated to and possessed by organizational members, lower levels of uncertainty exist. However, in a war-game simulation involving ROTC cadets and Air Force Academy Cadets, Huber et al. (in Jablin 139) found that more information leads to greater uncertainty. The result was explained as such: In tightly structured groups, whose members received specialized information about the environment and whose communication was restricted, members perceived more uncertainty about the environment than in loosely structured groups whose members were able to share information freely.

It can be concluded, therefore, that tight structures within chaotic organizations buffer some organizational members from information and loose structures facilitate informal communication processes. Turbulent organizations are characterized by increases in the number of formal communications directed to key decision-makers, increases in the number of work-related informal communications, and increases in downward communication. When faced with more turbulent environments, managers prefer more tightly organized structures. It is the tight structuring of turbulent military organizations of the past that has led to the perception of deceptive behavior by the military establishment.

It is within the looseness of the quality culture, however, that chaos reigns and the imposition of meaning has a much more dramatic impact on organizational life. Interpersonal communication, as we know it, is the essence of an organization because it creates structure. According to Weick, "...structures form when communication uncovers shared occupational specializations, shared social characteristics, or shared values the people want to preserve and expand" (98). Likewise, as organizations grow larger and more complex, they become known by their members less by direct experience and more by indirect images. These images are both historical and futuristic - registering what has happened and anticipating what will happen. Images and icons become the cognitive maps of organizations. These cognitive maps transform communication into perceived stable, collective structures and environments.

The transformation occurs because the organizations are loosely coupled systems. But, as with any map, this "looseness" reveals itself as indeterminacies and uncertainties between events--"looseness" is to be "filled in" by thought and interaction because uncertainty is uncomfortable. Consider any commander. Commanders resolve uncertainty

and indeterminacy by presuming, on the basis of cognitive maps, that there is some order "out there." The anticipation and predisposition toward order lures that commander to act, creating order through what was mere presumption--or, to put it another way, creating the perception of order in a chaotic organizational culture. According to Weick:

Thus language trappings of organizations such as strategic plans are important components in the process of creating order. They hold events together long enough and tightly enough in people's heads so that they act in the belief that their actions will be influential and make sense. The importance of presumptions, expectations, justifications, and commitments is that they span the breaks in a loosely coupled system and encourage confident actions that tighten systems and create order. (98)

Example. Wartime examples of successful, as well as unsuccessful implementation of these concepts provide the German "Auftragstaktik" (Mission-oriented tactics). In the 1920s, officers from the German General Staff developed a concept of operationally independent tank warfare (Dupuy 307). They saw a system of independently operating units characterized by mobility and movement in conjunction with fire power. This system allowed both the search for and exploitation of tactical as well as operational opportunities. The command objective became coordination through communication rather than actual deployment and direct control of movement. The last assumption would not have been possible without the "institutionalized excellence" (Dupuy 302) of the German General Staff. The implementation of the resultant Blitzkrieg doctrine led to the astounding defeat of France in 1940. The rapid advance, concentration, and reconcentration of the German troops, especially their tank clusters, met the French armed forces which, though materially equal, paid insufficient attention to cohesion and small unit leadership and lacked the proper flexibility and responsiveness to reply to the unexpected. Seemingly the same doctrine, applied against the Soviet Union in World War II, failed. The underestimation of the environmental-contextual element and the Soviet mobilization capabilities was further aggravated by the incongruity between the German political and military objectives and the inconsistency of the military objectives. The "Auftragstaktik" provides a unique example of how to increase the ability of a system in the face of an unknown and unpredictable environment, to form and change strategies on all levels, to generate diverse behavior, and to preserve self-consistency in achieving a communicated vision.

Conclusion

As we strive to tighten systems and create order, we are reminded that the conditions for order in organizations exist in the mind. For this reason culture, which affects the mind through meaning, is more important than structure. Likewise, chaos, upon which cultures are built, is to be embraced rather than ignored. The organizations that will not only survive, but excel in the next decade will be those which effectively manage and market chaos. The survivors will recognize that civilization is deeply based on subjective meaning and illusion, that generative processes that create are the key to survival, and--since prediction is impossible--punctuation and calibration must be examined for enlightenment. Zen Buddhists believe that life is like the sword that cannot hurt itself. Organizational life, likewise, is threatened by the recursive nature of knowing.

As part of the system, we can never have full cognizance of the system. We are like the acrobat on the high wire--maintaining stability through change, balance through imbalance, control through chaos.

Works Cited

- Beyerchen, Alan. "Clausewitz, Nonlinearity, and the Unpredictability of War." International Security 17.3 (1992/1993): 59-90.
- Bateson, Gregory. Mind and Nature: A Necessary Unity, Toronto: Bantam Books, 1988.
- Bourgeois, L.J.III. "Strategic Goals, Perceived Uncertainty, and Economic Performance in Volatile Environments." <u>Academy of Management Journal</u>, 28 (1985), 548-573.
- Dupuy, T.N. A Genius for War. The German Army and General Staff, 1807-1945. McLean, VA: Dupuy Institute, 1993.
- Gleick, James. Chaos: Making a New Science, New York: Penguin Books, 1987.
- Grassberger, Peter, and Itamar Procaccia. "Measuring the Strangeness of Strange Attractors." Physica 9D (1983): 189-208.
- Holden, Arun V. ed. Chaos. Princeton: Princeton UP, 1986.
- Hough, Richard, and Denis Richards. The Battle of Britain: The Greatest Air Battle of World War II. New York: W.W.Norton, 1989.
- Jablin, Frederic M., Linda L.Putnam, Karlene H. Roberts, and Lyman W.Porter, eds.

 <u>Handbook of Organizational Communication</u>. An Interdisciplinary Perspective.

 Newbury Park: SAGE, 1987.
- Katz, D., and R.L.Kahn. <u>The Social Psychology of Organizations</u>. 2nd ed. New York: John Wiley, 1978.
- Kiel, L.Douglas. "Nonlinear Dynamical Analysis: Assessing System Concepts in a Government Agency." <u>Public Administration Review</u> 53.2 (March-April 1993): 143-153.
- Leadership and the New Science. Videotape. CRM Films, 1992. 25 min.
- Littlejohn, Stephen W. <u>Theories of Human Communication</u>. 3rd ed. Belmont, CA: Wadsworth, 1989.
- Peters, Tom. Thriving on Chaos. New York: Harper Perennial, 1987.
- Richards, Diana. "Is Strategic Decision Making Chaotic?" <u>Behavioral Science</u> 35 (1990): 219-232.
- Tagarev, T., M. Dolgov, D. Nicholls, R. Franklin, and P. Axup. "Chaos in War: Is It Present and What Does It Mean?" <u>Air Command and Staff College CD-ROM</u> 1.1 (1994): Research\301Chaos.
- Waldrop, M.Mitcheil. Complexity: The Emerging Science at the Edge of Order & Disorder. New York: Simon & Schuster, 1992.
- Wheatley, Margaret J. <u>Leadership and the New Science: Learning About Organization</u> from an Orderly Universe, San Francisco: Berrett-Koehler Publishers, 1992.

Quality Function Deployment: What is It and How Can It Be Applied in Your Organization?



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Quality Function Deployment: What is It and How Can It Be Applied in Your Organization?

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Abstract

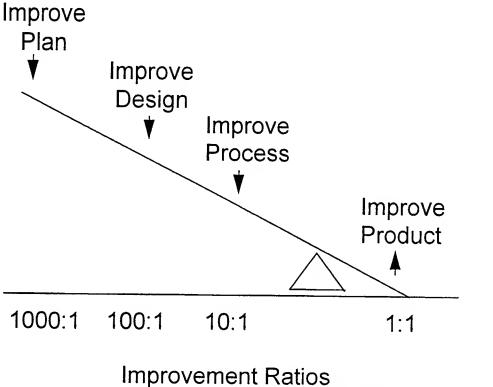
The purpose of this paper is threefold: spark an interest in Quality Function Deployment(QFD), give a brief overview of QFD, and give a practical example of how QFD has been used. QFD was introduced in the United States about ten years ago but it is still not being widely used in the military. QFD is the subject of 350 page textbooks and five day workshops, so this paper is by no means comprehensive. This paper examines the very basics of what QFD is and why it can be valuable. One unique thing this paper will do is give you a practical example of how QFD is being deployed. Almost all QFD examples in books or other materials have been altered so the company and real purpose of the QFD process would not be revealed. This paper exposes how the Air Force Quality Institute used the QFD process to improve the Quality Air Force Symposium with the customer in mind.

Quality Function Deployment(QFD) has been defined in many different ways by many different people; for our purpose we will define QFD as a process focusing on the voice of the customer though all stages of product or service planning and deployment. The QFD process uses many tools to focus on the customers' wants and needs. Quality itself can only be defined by the customer, and QFD uses those customer-defined wants and needs as the inputs to the process. By focusing on the customers the output will more likely fulfill the customers' wants and needs. QFD is not an end unto itself; the process is meant simply to ensure the voice of the customer is heard. Now that the voice of the customer has been heard it is still up to the organization to act on what the QFD process has revealed and implement it to the best of its ability. This process does not necessarily yield answers; it might only yield areas needing further study -- then once again it depends on the organization not to ignore this need but to study this area in more detail.

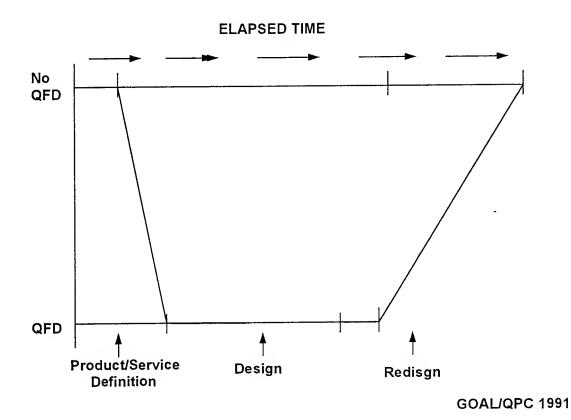
The concept of QFD goes back to the late 1960s when Yoji Akao first began to articulate his ideas. In 1972 Akao first introduced the documentation of QFD processes at Kobe shipyards in Japan. Akao then brought QFD to the United States in 1983 with an article in the American Society for Quality Control magazine *Quality Progress*. Dr Akao edited a definitive text on QFD

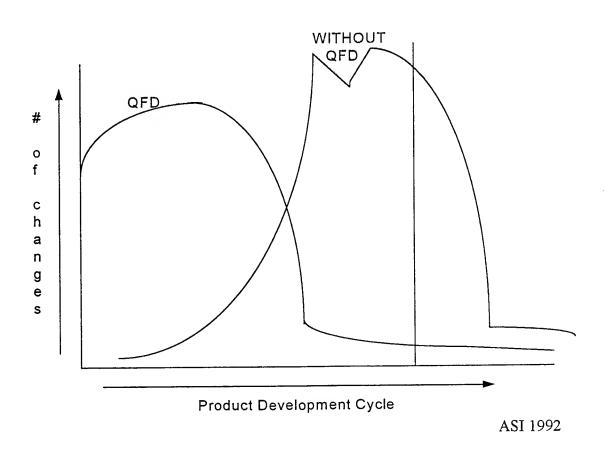
entitled <u>OFD</u>: <u>Integrating Customer Requirements into Production Design</u>. The text was originally published in Japan in 1988 then translated and published in English in 1990.(xv-xviii)

One may use QFD for many reasons. The organizational benefits to using QFD include improved product/service quality and customer satisfaction, increased productivity and teamwork, and a reduction in cost and cycle time(13). The next three illustrations vividly show some of these benefits.



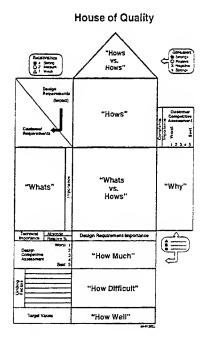
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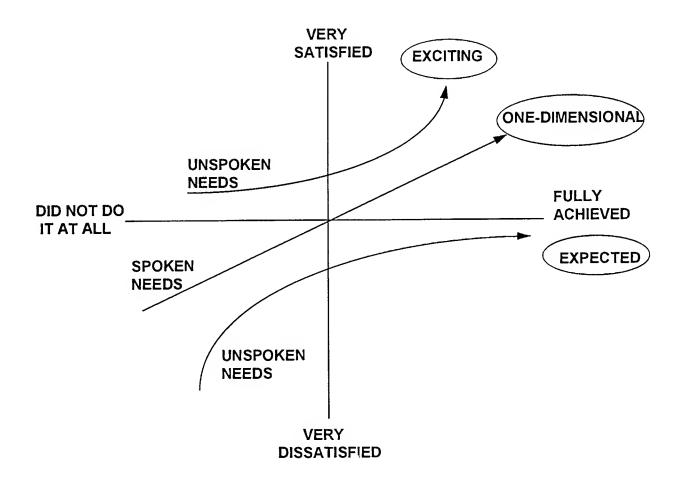
These three graphs show applying QFD enables an organization to go upstream in the process and lower costs by "fixing things before they break," thereby reducing overall cycle time. QFD also lets organizations be proactive instead of reactive. Many US companies spend many hours and resources to fix problems and "put out fires" after production has started. QFD allows companies to look at customer and design requirements and make most of the changes "on paper" without actually spending time and resources after production has actually started (5). By putting the customers' wants and needs literally first instead of figuratively first QFD lets companies reduce post production rework and increase customer satisfaction.

The next step in understanding QFD is to examine the quality chart or matrix. A matrix in its simplest form is a two-dimensional chart with two variables on an X and Y axis, and points plot the relationships in between. Essential to the QFD process are matrices which build a "house of quality." The house can encompass literally hundreds of charts and matrices, some three-dimensional others with thousands of relationships. Some matrices are important and generic to all QFD projects and those are the ones on which to focus. Everything focusing on the voice of the customer is plotted horizontally, while the design or technical requirement are plotted vertically. The customers' areas for plotting are usually voice of the customer, importance ratings, complaints and the customer competitive assessments. The design areas can include design requirements, importance, competitive assessments, limiting factors, and target values. The top or "roof" of the matrix contains the relationship between the different design requirements. Many other things can be plotted on the X and Y axis on other matrices, but for the purpose of this paper it is not necessary to detail all possible matrices to gain a basic understanding of the concept.



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Before an organization can jump head-first into developing matrices and plotting relationships the voice of the customer must be gathered, organized, and understood. The most important part of gathering customer data is to identify who your customers are. Once the customers are identified the appropriate mechanism must be used to gather the necessary data. Surveys are a common source for gathering this data, but they should be open-ended so comments and not just numbers are registered. The surveys used in this process should not measure customer satisfaction; rather, they need to find actual customer needs and requirements for the product. Once the customers have given their needs and requirements you must realize this covers only one of the three types of customer requirements. The other two areas not covered are expected and exciting quality. Expected quality items are those things left unspoken because they are expected; for example, a symposium should have speakers. Exciting quality items are those things beyond the customers expectations; for example, having the President of the United States speak at a symposium.



The expected quality items need to be captured along with the spoken "verbatim" comments from the customers. Since you typically have many customer comments, an affinity diagram can be very helpful. The affinity diagram is useful for putting the customer requirements into easily understood groups. The Air Force Quality Institute went through the QFD process to improve the

Quality Air Force Symposium; hopefully our story will help you see how QFD can be applied in your organization.

Mid-morning 22 Oct 93 marked the close of the first US Air Force Quest for Quality Symposium. Over 1600 people attended, many of whom completed our customer service questionnaires. The feedback from the attendees, to whom we will refer as customers, included many open-ended comments. Unlike a closed-ended question, which assumes we already know what is most important to measure, the open-ended question helps us determine what is important to the customer by allowing unrestricted responses--the customer can comment on anything. At the close of the 93 Symposium, the Air Force Quality Institute possessed a total of over 800 comments from our symposium customers. The challenge was to translate our customer comments, or "voice of the customer," into customer requirements, and incorporate those requirements into customer focused symposium process improvements. Quality Function Deployment was identified as the process methodology we would use.

As mentioned above we realize many benefits with QFD. We were aware of some of the textbook case studies showing the benefits. Early in the process we began to recognize some of the benefits we would experience. By design, QFD allows us to incorporate customer focused improvements into our symposium processes. From a macro viewpoint, this is a huge benefit because it provides a process for the symposium team to methodically pursue our goal of meeting/exceeding customer expectations. Looking at the QFD from a more micro perspective, you can recognize how we obtained benefits.

From our customer feedback we will determine importance ratings based on the frequency of occurrence of a particular comment. The importance rating multiplied by the relationship value of the design requirement to the customer requirement gave us a numerical figure. With these values assigned, we can determine the design requirements that were most important. Without this information, you may be missing design requirements or have design requirements which have little impact on your ability to meet customer requirements. Given limited resources, this is very valuable data. Another benefit exists in the considerations we made on the relationship of design requirements to customer requirements. These are commonly referred to as the "hows vs. whats." This part of the process revealed strong relationships of "whats to hows" we might not otherwise have considered.

A benefit of the QFD process we did not expect was a team building effect. The experience of the training and the effort required to work through the a QFD project helped build our team's cohesion while motivating the team members.

The QFD knowledge of our symposium team ranged from none to some members having training but very limited experience with the process. Because of the complexity of the QFD process and the training needs of the team, we decided the best approach was to begin with some "just-in-time" (JIT) training. The training brought us to a common baseline and prevented disagreements about the process once we began. There are two basic approaches for teaching QFD. While teaching you need data to fill in the house of quality. For the first approach, you can use actual data from your organization. This method may allow you to make progress with a real world example while you are learning the tool. The drawback to this method is the time spent working consensus issues. With the second approach you use a case study for your data. The benefit to this approach is the ability to refer to a "book" answer. This allows you to spend more time learning QFD and less time working real world issues. We elected the second approach. While training we made note of real symposium ideas for later application.

Following the training, we worked for 2.5 days with an experienced facilitator to help us "jump start" our symposium QFD. From that point we have worked without the benefit of an outside facilitator, meeting hourly each day.

We also faced some significant challenges. QFD requires a lot of work and time; therefore, it must therefore have strong support from management to ensure the required resources are available. QFD is best deployed in a team environment. The diverse perspectives and potential synergism of a team approach to QFD offers potentially better results. As with any team project, you will encounter group dynamics challenges. It will require many consensus decisions which present the potential for group conflict. A good, experienced facilitator/trainer can keep the process moving.

Shaping the future for the symposium team means delivering an event to the customer which meets their expected quality requirements and allows us to exceed that with exciting quality. Quality Function Deployment is the methodology which will allow our team to shape the symposium and ensure future customer satisfaction.

Unfortunately our QFD efforts have not been as fruitful as we had hoped. The symposium was fast approaching and events overtook us as we planned for the upcoming symposium. This illustrates one potential pitfall to using QFD on an existing process—the process does not stop for you to improve it. Working with a process being developed ensures you will devote the time to your project because you are working on developing a process and do not have the daily chore of ensuring the process is running smoothly.

Works Cited

Akao, Yoji, ed. QFD: Integrating Customer Requirements into Product Design. Cambridge: Productivity, 1990.

Qualtec Quality Services, Inc. Quality Function Deployment for Service Workbook. 1993.

Day, Ronald. Quality Function Deployment: Linking a Company with Its Customers. Milwaukee: Quality Press, 1993.

RAPID: A Recipe for Achieving Process Improvement Diagnosis



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RAPID: A Recipe for Achieving Process Improvement Diagnosis

TSgt Mark A. Young TSgt Donald A. Bennett 630 Air Mobility Support Squadron

Abstract

The typical process action team (PAT) training course teaches us that a PAT should meet between 1 and 2 hours a day on a weekly basis. PATs that we have conducted within our organization have taken 3-8 months to complete under this principle.

Mr. A. Donald Stratton, vice-president of Quality for Storage-Tek Industries in Colorado came to our organization in September of last year. He came to help us in our quality journey but more importantly, teach us a technique he developed while at AT&T called Cause Effect/Force Field Analysis (CE/FFA).

Most Air Force organizations have used the Cause Effect (CE) or "fishbone" tool to analyze a problem. Many organizations have also used the Force Field Analysis (FFA) technique to develop "solutions" for identified problems. The CE/FFA technique combines these two tools to effectively analyze root causes of problems and develop recommendations for each root cause category.

This technique has been used within our organization on eight occasions since Mr. Stratton's visit. We have made some minor modifications to the technique to personalize it to meet our needs. We have found that this tool has no limitations in the types of problems in which it can be used. In fact, we have recently used it to assist the Army and Air Force Exchange Service (AAFES) at Yokota AB work a warehouse storage problem. We believe that it can produce outstanding results Air Force wide because of how effectively and efficiently it attacks a problem.

Background

The two main difficulties we have had with the typical PAT process is the amount of time to complete and maintaining continuity. We have conducted many PATs in the past; meeting once a week on an hourly basis. Many of these PATs produced excellent results, however, the problems we continually had was that it was taking between 3-8 months to complete and submit final recommendations to management. We found it difficult keeping the team focused and maintaining continuity. PAT members were frequently unable to attend meetings due to working different shifts, work commitments, temporary duties, and leaves. The first 15 minutes of a PAT meeting was typically dedicated to updating the team and reviewing previous meeting notes. This left only 45 minutes to work on PAT issues.

This technique alleviates these problems. Most issues that a normal PAT works can be analyzed and recommendations submitted to management in the same day by using the "RAPID" technique. We feel that this technique is a recipe for process improvement because it is a conglomerate of many effective tools. The PAT members that have been selected will spend 1 full day working the issue. The obvious benefits to this is that the team will be focused on the problem. Additionally, there is not the inherent problem of people being absent in future meetings.

The first time we used this tool was when Mr. Stratton visited our organization. We worked a topic that everyone in the organization could relate to: the enlisted and officer performance report process. We have used the technique seven times since then. Each time we have used this technique, we have learned how to "adapt" it to better meet our needs. Shortly after Mr. Stratton's visit, each En Route base in the Pacific was tasked to form a PAT to analyze the launch and recovery process of the aircraft that are processed through their respective location. We at Yokota saw this as an opportune time to use to CE/FFA tool. All stakeholders of this process came together to work this tasking. Two of the highest priority drivers were aircrew continuity and communication with the Tanker Airlift Control Center (TACC). After talking with the other En Route bases, we found that these two issues were major concerns at their locations as well.

To properly address these two issues, all the En Route locations agreed to hold a conference at Yokota AB with all the involved customers and suppliers. Forty-five maintenance, aerial port, and command and control representatives from Yokota, Osan, Kadena, Guam, Elmendorf, and Hickam Air Force Base as well as aircrew representatives, stan eval, and a person from TACC attended this conference. The CE/FFA tool was again used to perform this task. There were three different sessions occurring simultaneously between three functional areas: Command and Control, Maintenance, and Aerial Port. We will use this example to explain the step-by-step process of the technique.

Requirements

The key to any process improvement effort is management commitment. This is important because of the 80/20 rule. W. Edwards Deming and Joseph M. Juran both agree with the theory that problems are divided into two parts: common and special causes. Deming says the ratio is 85/15 and Juran says is 80/20. In Mr. Stratton's work, he found it to be 82/18. The key is how close these number are to each other.

Common causes are process problems that are owned and controlled only by management. Special causes on the other hand occur only 15 to 20 percent of the time and are those that can be

attributed to people, machines, or tools. The impetus of this rule, as it applies to the use of this tool, is that only management can change or alter a process. The worker is not responsible for scheduling people, buying new material or equipment, or changing policies and procedures. In order for this tool or any other process improvement tool to be effective, management must be willing to empower the team to make change and act upon the teams' recommendations. One of the biggest hindrances to process improvement efforts is when employees make numerous recommendations but management does not act. Management must know that empowerment is not just asking for inputs, but taking the responsibility to implement, as much as possible, the recommendations the team develops. For those recommendations that can not be implemented, its imperative that the team and employees be given a reason why. Failure to act can cause future process improvement efforts to fail! Additionally, its important that feasible recommendations be implemented as soon as possible. In fact, some actions should be immediate. When employees see management acting on their recommendations, they will be much more likely to continually look for process improvement opportunities.

A second key element is a skilled facilitator. This person must understand how to use this tool prior to the meeting. Just as the case of any PAT, the facilitator must create an atmosphere of open participation and discussion. Unlike a typical PAT, a "team leader" is not necessary. The facilitator will lead the team through the process and take a more active role than he/she normally does in the typical PAT. The facilitator does not have to be knowledgeable in the process. The only requirement is for this person to be knowledgeable in the facilitation skills such as brainstorming, how to use the cause effect, force field analysis, and affinity diagramming tools.

The Process

The team is comprised of between 6 to 12 people. It must be small enough to allow every member sufficient time to participate and large enough to have functional representation from all required areas. We used to require all team members attend PAT training before they could participate on a PAT. We felt this was necessary because it taught them the PAT process, the importance of teams, and the tools used during a PAT. This technique requires no training prior to the meeting. The team members learn the tools as they are led through the process. The only requirement is having team members that are motivated and knowledgeable in the process being worked.

A problem statement is required prior to the meeting. This is developed by the process owner. Since this technique can take up to 10 hours we normally begin the day at 0700. The session begins with an introduction of the problem statement by the process owner. It's important that this person reflect a strong commitment level to the team during the introduction. The impression the team receives can determine the amount of enthusiasm and commitment the team members have to work the issue throughout the day. The process owner will leave the room after the introduction and return for the management debrief at the end of the day.

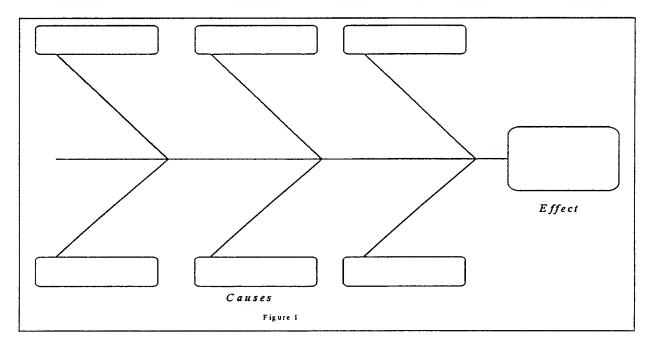
After the introduction by the process owner, the facilitator will give a short overview of the day's events. The main steps of this technique and what should be covered in this introduction include the following:

- 1. Brainstorm problems/causes relating to the problem statement.
- 2. Do cause effect chart.

- 3. Do force field analysis chart for each cause effect category.
- 4. Prioritize drivers.
- 5. Brief management.

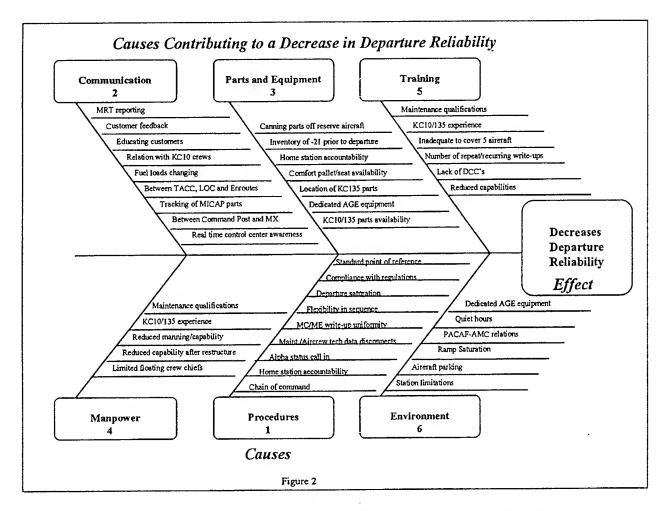
The first step is to develop a "laundry list" of all causes that relate to or have impact to the identified problem. We always use the "round robin" technique to brainstorm. This allows each person the opportunity to participate and does not allow any one person to dominate. A technique that we have started using is to have a second person that is not a team member write all the inputs on small post-it paper at the same time as the scribe is writing it on flip-chart paper. This saves time in completing the cause and effect and force field analysis charts. The purpose of this will be explained as these two phases are discussed. Clarification is to be done after all ideas are exhausted. It is important that everyone understands all the inputs before proceeding to the next phase. It is also important to keep the meeting moving at a fast pace while doing this. The brainstorming portion normally takes between 20-40 minutes.

The next phase is to complete a cause effect (fishbone) chart. ?" We have found that the easiest way to complete this phase is to build a template of the cause and effect chart similar to that of figure 1. The team first determines the effect. We do this by asking the team to take a few minutes to review the brainstormed topics. The question is then asked: "what is the single effect of these causes?" We've found that the easiest way to complete this phase is to build a template of the cause and effect chart similar to that of figure 1. Determining category titles and assigning the brainstormed topics to the appropriate categories can be difficult. We are now using the affinity diagramming technique to perform this portion of the procedure. The purpose of the affinity diagramming technique is to systematically group like items. There are numerous ways that this tool can be used. We will explain how we have used it in conjunction with this process.



This is where we now take the post-it notes and put them to use. The first step is to spread them out on the table. Next, like causes are grouped by combining similar topics. There should be between 4 to 7 groups of similar topics. Once the team members agree on how the inputs are grouped, the cause and effect chart is ready to be built. It is as simple as taking each

group of post-its and attaching them to separate causal categories on the template of the cause and effect chart. The next step is for the team to determine appropriate category titles. Typical category titles are training, communication, procedures, manpower, and equipment. The only remaining step is to prioritize the categories. Nominal grouping can be used to accomplish this. The priority of each category is put in or just outside each category box. A completed cause effect chart will resemble that in figure 2. This phase now takes us approximately 20-30 minutes to complete where it used to take at least one hour.

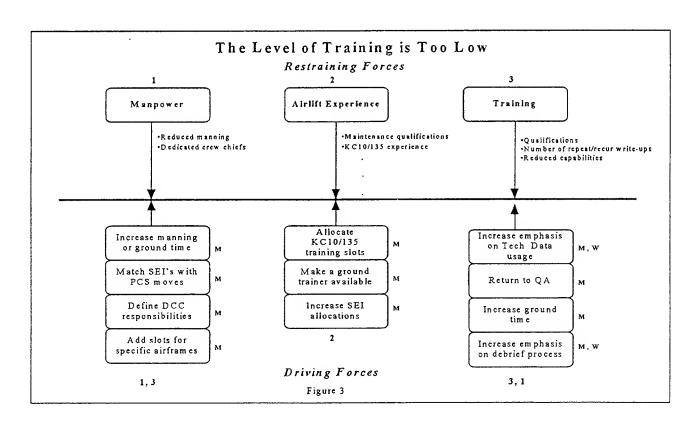


The next phase is to build the force field analysis charts. The purpose of FFA is to counter the restraining forces with drivers. Drivers are the possible solutions to the restraining forces within each category. Refer to figure 3 as this tool is explained. Each category from the cause effect chart requires its own force field analysis chart. Step 1 is to determine if the level is too high or too low. For example, if the category is training, the title of the FFA chart could be as follows: "The level of training is too low". If the level is too low, the restraining forces would be above the line. If the level is too high, the restraining forces would be below the line. These forces are what is keeping the level of performance at its current level. The horizontal line represents the current level of performance. If the recommended drivers are implemented, the

horizontal line will move in the direction of the restraining forces and the level of performance will improve.

The affinity diagramming technique can again be used to build the FFA charts. The category with the highest priority is worked first. The same post-its can again be used to complete these charts and build the restraining categories for the FFA charts. All causes for the first category are taken from the cause and effect chart and grouped in the same manner that was used to build the cause and effect chart. This is accomplished for each cause and effect category. Restraining categories in the training example were manpower, airlift experience, and training. The affinity diagramming technique can also be used in this phase to categorize each topic. Each restraining category is numbered consecutively from left to right, and each specific topic is listed on the chart under its appropriate category. We use the same post-its and attach them under the restraining category agreed on by the team. This is done so the team can develop driving forces for each restraining force identified.

The team is then asked what can be done to fix all of the topics within each category. Once this is accomplished for all drivers within each category, the relationship between categories is determined. If the drivers under category 3 also have impact to the restrainers under category 1, it is indicated by putting a 3 and a 1 under the last drivers box. The purpose of this is to help the team prioritize the drivers once all the FFA charts are completed. The team is then asked to determine who is responsible for implementing each driver (management or worker). Management is indicated with a M just outside each driver box and worker with a W. In some cases, it may be the responsibility of both management and worker.



As we mentioned earlier, this is a process that can take up to 10 hours. We normally have lunch brought in to the meeting location. We only break for lunch long enough to eat and then get back to work. This can be very difficult to manage if the team is not kept focused and involved. To provide training in facilitation and to maintain a high energy level, different team members can facilitate the team as they go through each FFA chart. The facilitator can lead the team through the first FFA chart and the team members can then lead the team through the remaining charts. This option of course depends on time limitations and the scope of the problem.

Once the team has completed each FFA chart, we have found it beneficial to prioritize the drivers. The purpose of doing this is to focus the process owner(s) on the important implementation steps. They are asked to pick the top 2-3 drivers from each FFA chart. We have the team focus on drivers that can be easily implemented, are feasible, doable, and will have an immediate impact. If there are drivers that the team feels strongly about, but may take longer to implement, by all means, write it down. For example, when we recently worked with AAFES, one of the drivers that was listed as a priority was to purchase new shelving units. This of course would cost quit a bit of money, but it would resolve many of their other problems.

The next phase is to brief management. All managers associated with the process should attend the management debrief. The debrief can be done in many ways. One option is for the facilitator to open up the briefing and explain the steps that were taken that day and then have one or more team members brief the FFA charts and the prioritized list. Another option is for different team members to brief each step in the process. We like to have as many team members involved in the briefing as possible. We encourage management to provide feedback to the team during and/or after the briefing. Since many of these may be easy fixes, there may be some that can be implemented immediately.

After the presentation to management, a Quality Resolution Team (QRT), made up of management is formed. The QRT's job is to track each driver until it is implemented or rejected. The process owner either chairs the QRT or delegates this responsibility to a manager under his/her chain of command. This team can be made up of other managers and/or members of the team. They will review all drivers and provide a status update as soon as possible. A spreadsheet similar to that in figure 4 is necessary to track all of the driving forces. This can be posted in all areas of the organization to provide feedback to the employees.

Driving Force	Assigned To	Status
Increase manning or ground time	TSgt John Greenwell	PAT required - start date: 15 July
Match SEI's with PCS moves	MSgt Don Ferrell	Under review
Define DCC responsibilities	MSgt Sam Henderson	Policy book being done
Allocate KC10/135 training slots	Capt Tom Corneil	Allocated 2 per month

Figure 4

There more than likely will be times when some drivers will require to be worked using the traditional PAT process. Some drivers will require cross-functional coordination. When we conducted the En Route alignment conference, one of the drivers was to build a sequence of events at each location. This is not something that can be done during the one day that the team meets. It will be up to the QRT chairperson to determine if there are drivers that require further review.

Conclusion

The beauty of this technique is that the solutions are now broken down into a manageable and organized representation of the problem. We have found that many of the drivers can be implemented immediately and at very little cost. We recently used this tool to "improve customer service between our Support section and the Maintenance section. One of the recommendations was to realign the hours of the Support section to improve the turnover process during shift changes. The supervisor of the Support section implemented the recommendation within 24 hours after the meeting.

To get to the implementation point using the traditional PAT procedures used to take many months. The team lost focus after a few meetings. It was also taking a long time before the organization saw any results of the PAT. Members of the PAT became frustrated and it was difficult to maintain continuity. This one day format is not easy. It breaks some of the rules of the traditional PAT process. Keeping a team focused and energetic for 8-10 hours is not an easy task. We definitely feel that the advantages of this technique far outweigh its disadvantages. The key to it's success is management commitment. If members of the organization see management acting on the team's recommendations, future process improvement efforts will soon follow.

References

Stratton, A. (1988). <u>An Approach to Quality Improvement that Works.</u> Milwaukee: ASQC Quality Press.

Walton, M. (1986). The Deming Management Method. New York: Putnam Publishing Group.

Real Quality Assurance in Aircraft Maintenance



SMSgt Martin E. Miller

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REAL QUALITY ASSURANCE IN AIRCRAFT MAINTENANCE

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ABSTRACT

Traditional quality assurance procedures have not been successful in long term improvement of the overall quality of aircraft maintenance. Pressure to meet artificial goals based on subjective evaluations by the Quality Assurance (QA) section has caused units to hide problems to avoid negative feedback from senior leaders. Improvement is difficult because information from outside agencies is incomplete or in a format that is difficult to analyze. To improve the quality of it's aircraft maintenance, the 523 Fighter Squadron (FS) implemented a different approach using supervisor evaluations and worker collected data, together with basic quality tools. This paper discusses the background behind the process, how we collect and analyze the data, and how we use the data to develop plans to improve training and increase the overall quality of our products and services. I will also show some results we have seen with this process and cover the obstacles we have encountered.

HISTORY

The use of independent quality inspectors, responsible for the overall quality of a product or output, started with the Scientific Management principals of Frederick W. Taylor in the early 1900s. These concepts have changed very little since that time. While independent inspectors in aircraft maintenance guaranteed a constant flow of inspections of final products, they did little to actually improve the quality above a set standard. The only impetus to improving was to avoid the pain of explaining why an organization was below an expected level of performance. As organizations attempted to reach the standards, they had a choice of three methods to meet them. They could either distort the process to get the demanded results at the expense of other results. they can distort the figures or they can improve the process². The distorting of the process showed as a slow down of maintenance when QA was present. Doing things the "right way" or the "quick way" depended on the presence or absence of the QA inspectors at the job site. The failure of inspectors to write down all discrepancies in order to reduce the "Black hat" image is an example of distorting the figures. This practice resulted in incomplete data for the workcenter supervisor and a higher or lower than actual pass rate shown to senior leaders. Both of these actions tended to give senior leadership the picture they wanted to see, but not always an accurate picture. Because of these factors, sound management decisions for improvement of quality were secondary to reacting to perceived out of standard conditions. Any below standard data point was cause for immediate and severe management action.

The idea that detection, intimidation and fear will ensure the quality of a process is not compatible with the new quality culture. "Quality comes not from inspection but from improvement of the process"³. With the subjective "pass or fail" approach to traditional Quality Assurance, it is not easy to diagnose how a process is failing or determine what areas to concentrate efforts to improve it. The traditional approach to quality assurance concentrated on keeping statistics above a predetermined level and did not account for normal variation in the

maintenance processes. This practice reinforced the negative perception of QA and forced units to hide problems as opposed to trying to fix them.

People who have studied how organizations have improved the quality of their processes have seen the problems with mass inspection. Dr. W. Edwards Deming, in his fourteen points of quality stated that "Companies that depend on mass inspection to guarantee quality will never improve quality. Inspections are too late, unreliable and ineffective." He went on to say that "Quality belongs in the hands of management, supervisors and production workers. They have the most to contribute" We must find a way to harness the skills and talents of all personnel to reduce rework and increase effectiveness and efficiency. Supervisors have always had an intrinsic responsibility to "Observe, counsel and correct subordinates on matters of duty performance" and "Evaluate assigned personnel and determine training needs." What we must do is take away the negative connotations of quality assurance, emphasize trust in our people to do a good job and reinforce the positive aspects of increased quality.

During a time of reduced manning and roll backs, we also need every trained technician on the production line. Our system made non-productive inspectors out of highly trained technicians in order to attempt to inspect-in quality at the end of the production line. The Japanese have structured their quality control system differently. They feel that, "Inspectors are unnecessary personnel who reduce the overall productivity of the company." We need each technician in a productive role as a worker or supervisor building in quality from the start of the process.

BACKGROUND

A new way of looking at aircraft quality was first used by the 86th Fighter Wing Standardization and Evaluation Section, Ramstein AB, Germany, to categorize types of errors noted during evaluations on F-16 aircraft. The process de-emphasized traditional "pass or fail" criteria as a sole determination of maintenance quality. The 523 Fighter Squadron (FS), Cannon AFB New Mexico, implemented the self-evaluation process on the F-111F aircraft in 1993. The squadron used the process as an internal method of improving the quality of aircraft maintenance without depending on information provided by the wing QA program.

The "Self-evaluation Process" used since January 1993, has improved the overall quality of maintenance in the 523 FS. By improving the overall quality of aircraft maintenance, we provide better quality, combat capable jets to the aircrew and reduce the amount of rework thereby saving time and money.

I will explain the 523 FS approach using the seven main areas from the Quality Air Force Criteria.8

LEADERSHIP

Leadership at the section, flight, squadron, group and wing level must change their concept of quality within aircraft maintenance. Leaders throughout the organization must analyze the data available and use it to make sound management decisions. This new approach depends heavily on senior leadership accepting new ideas about quality and relying less on the old, largely subjective, pass or fail criteria used by conventional QA functions. Senior leaders need to use critical customer quality performance measures such as abort rate, repeat or recur rate and mission capable or effectiveness rates as measures of an organization's overall quality.

The self-evaluation process relies on the supervisors and workers generating appropriate data on maintenance processes and analyzing this data to correct root causes of problems. The process

also depends on the mid-level supervisors "buying-in" to this new method of quality assurance. Their direct involvement and acceptance of responsibility, as a supervisor, is paramount to the program's success. Senior supervisors must overcome the fear associated with reporting defects or problems by a willingness to allow section leaders to report and fix their own problems using new techniques. Training in quality methods and tools will help these supervisors buy-in to the new approach. This must be the initial step in implementing the new system. Training in evaluating, collecting data, analyzing data and planning corrective actions must be an integral part of the buy-in process. The training must emphasize that, in most maintenance actions, the aircrew is the real customer. It should also emphasize how the product quality affects the aircrew and the overall capability of the organization. In some processes the customer may be internal. Who that customer is will determine what actions to take to meet their needs and wants. To some supervisors, this new process may seem to be "Quality for the sake of quality." Leaders can eliminate this stumbling block by continually demonstrating the importance of the new process to them as supervisors and how using the data generated by the process improves their ability to make sound management decisions.

INFORMATION AND ANALYSIS

Because complicated data gathering tools cost both time and money, the self-evaluation process depends on uncomplicated evaluation and data tools. We write all discrepancy data gathered during an evaluation on a record form and send it to the section supervisor for review. During this review, the supervisor transfers the discrepancy information to a check sheet (figure 1) for that particular area.

523 FIGHTER SQUADRON SELF-EVALUATION PROGRAM

DISCREPANCY	OCCURRENCES
ILLEGIBLE ETCHING	HT HT HT HT HT HT HT
DOUBLE ETCHING	THL .
NOT MARKED OR ETCHED	M M M
SWAPPED TOOLS	111
UNSERVICEABLE TOOLS	II HTHE HT
INCORRECT TOOL SUBSTITUTION	
OVERDUE INSPECTION	TH II
CORROSION	THE THE LAND
FOREIGN OBJECTS	I HT HT HT
MISSING REQUIRED PAPERS	1
MISSING TOOL LIST INCORRECT	1/1
EQUIP CONTROL LIST INCORRECT	
BOX APPEARANCE OR CONDITION	11

CONSOLIDATED TOOL KIT CHECK SHEET JANUARY 1993

The check sheet is a tool that makes collecting data an easy process and allows for quick analysis of day-to-day trends. We found the easiest method to sort aircraft discrepancy data was by the area of the aircraft, from the -6 work cards. Each aircraft area or equipment area has a separate check sheet. Besides the aircraft areas, we established check sheets to monitor Consolidated Tool Kits (CTK), aircraft form's entries and support equipment. Later we added unsatisfactory conditions (e.g., failure to follow tech data, safety or tech data violations or other unsatisfactory conditions), Foreign Objects (FOD), Hazardous waste, part processing, phase inspections and Joint Oil Analysis Program (JOAP). These 18 areas encompass nearly all of the processes within maintenance.

For some areas, the workers themselves collected the data. The workers annotated every discrepancy they noted while accomplishing tasks on a day-to-day basis. This was especially productive in the CTK area where 30 day inspections produced a wealth of data. Checks by supervisors of pulled forms identified many common mistakes in aircraft form's entries.

By using check sheets in this way we consolidated discrepancies into a smaller more manageable grouping that we can break down into individual processes for analysis. Additionally, the check sheets provide daily feedback to supervisors and workers on where to improve.

At the end of each month, maintenance supervision consolidates the individual check sheets into a Pareto analysis (figure 2) of each area to identify the high discrepancy areas.

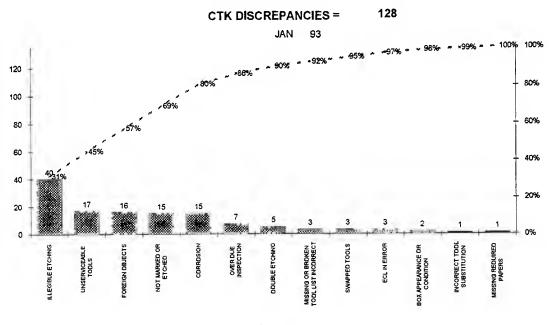


Figure 2

By depicting the discrepancy information in this manner, we identify high discrepancy areas in which to concentrate our initial efforts, identify possible training deficiencies and areas where processes are breaking down. You must complete a detailed analysis of why high discrepancy areas occurred to isolate the "root cause" and eliminate it through improvement of training, equipment or management of the process. Train workers as well as supervisors in the analysis of the Pareto charts in order to involve them in elimination of defects. Displaying the Pareto charts in a common area and encouraging workers to actively suggest possible corrective actions

provides a positive path to improvement. The 523 FS encourages the workers, through an active suggestion program, to submit ideas to reduce errors. Supervisors and workers incorporate these ideas to improve the overall quality of the products and services provided to the customer.

PLANNING

Design plans to improve processes, not improve quality assurance pass rates. Plans must identify the action needed to improve quality through additional training, better equipment or additional resources to meet mission and customer requirements. Ensure you consider new personnel as part of the training plan. Train them in the new approach so that previously identified problems do not reappear as normal personnel rotations occur.

RESOURCE DEVELOPMENT & MANAGEMENT

Section and flight supervisors should look for more than just defect data. They must look at individual training proficiency and the training and proficiency of the supervisor evaluating the maintenance. Failure to train supervisors in the correct way to evaluate can lead to inaccurate data, no data at all, or worse yet, acting on the wrong data. Choosing people to evaluate is important. Supervisors used to certify tasks in the On-the-Job training (OJT) process may be the same people that you would want to evaluate the proficiency and training of the unit members with the self-evaluation process. These individuals are already involved in unit training at the section level. They should have an adequate working knowledge of Air Force quality concepts and how the unit mission and customer focus are inter-related to the quality of the maintenance process. I do not advocate the use of "in-house" quality assurance. You reduce the benefits of this program when productive members of the unit become non-productive inspectors, charged with "inspecting in" quality after the fact.

Integrate workers into the process as collectors and analyzers of discrepancy data. Train workers to interpret the discrepancy data and relate it back to the quality of the product or service that they produce for their customer. By putting this data at their finger tips, you allow them to make changes in their work area based on the data they collect. It encourages horizontal communication with other sections to reduce discrepancies and improve the overall quality.

LEADERSHIP AND THE MANAGEMENT OF THE PROCESS

The mechanics of our process is similar to the methods used by traditional quality assurance to evaluate maintenance. For supervisory evaluations, the ACC Form 30 (figure 3) or similar form, is a readily available tool. Set up the form provide the maximum information with a minimum expenditure in time to complete the form.

Like normal QA evaluations, we evaluate the ability and proficiency of a technician to perform a given task. Unlike normal QA evaluations, we stress getting discrepancy information more than meeting a subjective standard. The more discrepancies we get, the easier it is to determine the cause and make a long term corrective action. A "no threat" environment where the worker can be honest with the supervisor about areas he is not sure about is much more productive than one where the worker is afraid to tell the truth. This type environment allows the supervisor a chance to see how the worker accomplishes the given task and ensures the worker understands who the customer is and why the job is important to the organization. One of the great benefits of this program is that it affords the worker and supervisor an avenue for two way communications. The supervisor should emphasize the positive by allowing the worker to ask

questions and talk about problems he is having and for the supervisor to transmit expectations and customer focus to the worker. Additionally, the supervisor should use this time to immediately retrain the individual in deficient areas and reinforce proper maintenance practices.

TYPE MAINTENANCE			TE C	TENANCE EVALUATION / INSPECTI						
OVERALL RATING:	EXCELLENT	SATEFACTORY NON-RATED	SUPERVISOR BRIEFED				CLAEE		1	В
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OFFICE RQUTING:	TO:	NIT:	TO:	INIT; 1	о.		IMIT;			

Figure 3

ACC FORM 30 JAN 90

Subjective pass or fail criteria makes it difficult to give constructive comments without labeling the individual as a failure or giving him or her the false impression that some defects are "OK." The traditional approach also doesn't always accurately portray the quality of maintenance within the unit. Inspectors don't report some discrepancies while they inflate the severity of others. Every discrepancy is valuable in determining the overall quality and training situation in the unit.

The supervisor should review the individual training record, annotate any required training and ensure that the worker is current for that particular task.

During the evaluation, the supervisor should find out more than just how this individual does his job. He needs to evaluate the support equipment the individual uses. Look at the tools and equipment to gauge the worker's supplier quality because they are major factors in how the individual does his job. Report defects in these areas also and incorporate them into the applicable check sheet. Do not overlook any area of the task. We want him to check the tools, technical data condition, and support equipment along with safety and technical order compliance.

After the evaluation, the section supervisor reviews the data and annotates all the discrepancies on the check sheet. Besides discrepancy data generated by workers and

supervisors, we also incorporated discrepancy data generated by outside sources including wing QA, the Foreign Object Damage (FOD) prevention team, and safety. Use any information that is available to increase the scope of data and give a better picture of the quality of the product or service produced.

Produce the Pareto chart by combining data from each type check sheet (of the same type, e.g., all CTK sheets) into an overall analysis of discrepancy data. A spread sheet program simplifies the tracking and chart making function. Using a spread sheet program also allows you to analyze specific discrepancies over a period of time.

RESULTS

We used the 27th Operations Group QA overall pass rate to illustrate what we have seen using the process. (Figure 4)

OVERALL QUALITY ASSURANCE PASS RATE JAN 91-JUNE 94

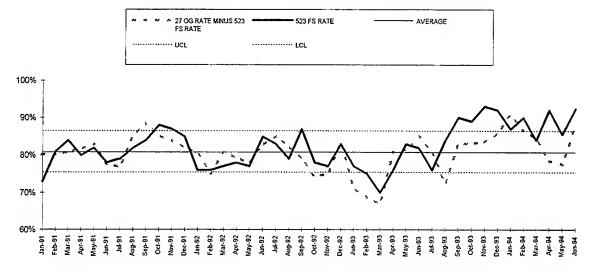
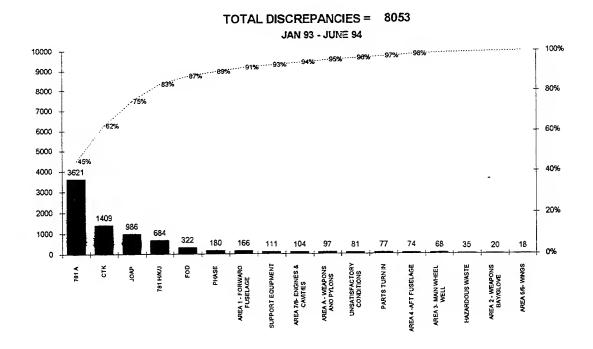


Figure 4

To baseline our improvements we compared the Group QA overall pass rate for the two years prior to implementing the process to find an average pass rate and establish upper and lower control limits for this period. From 1991 to 1993 the fighter squadrons in the Operations Group averaged an 81 percent overall pass rate for two years (Jan 1991-Dec 1992). (Upper Control Limit 87%, Lower Control Limit 75%). Since implementing the self-evaluation process in Jan 93, the overall level of quality within the 523 FS has shown a steady increase and exceeded the upper control limits 8 of the last 10 months charted.

Those areas where we saw the greatest involvement by the workers and supervisors had the greatest number of discrepancies noted. We tracked and analyzed over 8,000 discrepancies in the 18 months of the program. Over 85 percent of the discrepancies noted were in the special inspection area, and this was also the area where we noted the most improvement with an increase in pass rate of over 11 percent. We noted the largest improvement in areas, like Consolidated Tool Kits, support equipment and documentation.



CUSTOMER FOCUS

The most important part of this or any process is how it affects the customer. The customer wants and needs a product or service that is defect free, reliable and usable. Our job as supervisors to is focus our energy toward improving the quality of the process not meeting an artificial goal or standard. When you define what a defect is, you must consider how it affects the customer. The "standard operating procedure" mentality, and defects that had little or no effect on the customer was the basis of some QA discrepancies. We expend a lot of work to eliminate "defects" that did not affect the customer or did not affect the quality of the product or service. You must critically analyze the overall value of spending time to fix a "Defect" that is not really a discrepancy. If workers understand the effect of a defect on the customer, they will work even harder to eliminate that defect. Examine each process to see who the customer is for that process and what defects affect how they use the product or service.

OTHER APPLICATIONS

This process can be effective in other military or non-military applications although we developed this process for an aircraft maintenance organization. It is just as effective in reducing errors in administrative processes such as performance reports or decorations or in analyzing pilot training deficiencies by tracking check ride discrepancies

LESSONS LEARNED

Numerous obstacles stand in the way of a successful deployment of this process.

1. This process is not a cure all for maintenance quality problems. This process works because of a dedication to quality by the organization.

- 2. Use of the process results as the sole method of determining the quality of an organization will doom any attempt at improvement to failure. Manipulation of the data to get required results will hamper any effort to get accurate information.
- 3. Leadership must do more than direct an idea to lower levels of the organization. At one Air Mobility Command Base contacted about how they coped with the loss of QA, they said that they had instituted a program of supervisor generated evaluations without much success. Supervisors were not willing or trained to pick up where QA stopped. Using the "directive approach" without training, and without the essential buy-in by mid-level supervisors, the process will not work.
- 4. Identification of specific supervisors to accomplish these evaluations is essential. A general request for evaluations from supervisors will not persuade them to comply. Indoctrinating them on the importance of a viable quality process and their responsibility as a supervisor in that process must be part of the buy-in by supervisors. Training in evaluation, customer focus, and Quality are main points in getting accurate data from supervisors.
- 5. Leadership involvement in keeping the process on track is also essential. In the 523 FS, a 5 month deployment during the first part of the year resulted in no data from the deployed location. Lack of leadership involvement at the deployment location was the key factor in the loss of this data. A lack of training in the value of the program, how the program was working and a lack of buy-in by mid-level managers, resulted in the break down of the process.
- 6. Just as in any process, evaluating only for the sake of statistics is a waste of time and manpower. You must systematically analyze the data and adjust accordingly to improve the overall efficiency and effectiveness of the processes for the customer.
- 7. Continue to plan and train new workers and supervisors. Without continuous emphasis the program will immediately start to deteriorate. Train new supervisors as they come in to the organization in all aspects of the process. They must understand how to make sound decisions using the data. One area that we overlooked initially was continuing education in the use and collection of quality data from the process. Our initial plan concentrated on mass training of the squadron through quality awareness training. Once we trained the people, the process sustained itself until an influx of new people arrived. At that point we realized we had failed to consider the effect changes in management and workers would have on data collection. This did not become apparent until increased levels of unacceptable QA inspections appeared even though discrepancy data decreased. This forced management to step in and find out why the process had broken down. Interviews with section personnel showed us that a lack of planning for training of new personnel was the largest contributor to the decrease in quality.

SUMMARY

A system using worker and supervisor generated data puts the responsibility for a top quality product and the ability to improve that product back where it belongs, in the hands of workers. Only when we develop this process fully and change our culture to accept new ideas about quality will "Real" Quality Assurance in aircraft maintenance become reality.

¹Taylor, Frederick W., Scientific Management, 1911 page 100/101 "Shop Management"

² AFP 50-34, Promotion Fitness Examination Study Guide, Chapter 13, page 243

³Walton, Mary The Deming Management Method, 1986 page 60

⁴Walton, Mary The Deming Management Method. 1986 page 94 "Reliance on quality Control Departments"

⁵AFR 39-6, NCO Responsibilities, Chapter 6(1)

⁶ACCR 66-5, Objective Wing Aircraft Maintenance, Chapter 3-7d

⁷Kadru, Ishikawa, What is Total Quality Control? The Japanese Way, 1985 page 77 "Inspection Oriented

Maintenance"

⁸ Capt Moss, Quality Air Force Criteria. 1993

Recomputing Control Chart Limits



SSgt Bruce Strickler

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Recomputing Control Chart Limits

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Abstract

This paper provides some ideas about recomputing control chart control limits. This can be an important issue if the limits are being computed manually, when recomputing them more than needed wastes time. When using computer programs that can recompute the limits in microseconds it is tempting to recompute the limits with every new data point, but there are dangers involved in this practice.

The Dilemma

The use of control charts can raise questions to which, like many things in life, there are many different answers. For most questions of this type, there is usually one textbook answer (considered to be THE correct answer), any number of other ACCEPTABLE answers, and any number of WRONG answers. The acceptability of a given answer depends on the particular situation in which the question is raised.

The main question that this paper was intended to address was "When should one recompute the control limits of a control chart?" During the development of the example control charts used, more questions came to light. The answer to the main question depends heavily upon the answer to these other questions.

The most effective way to investigate recomputing control limits, is to use an example. The example used herein is one suggested in Henry R. Neave's The Deming Dimension (61). The data set consists of a daily data point representing the weight of an individual. The individual in question was trying to lose weight. He would have periods of successful weight loss followed by periods of weight gain. In order to get a better understanding of the process that controlled his weight, the individual began charting his daily weight on a control chart. An Average and Moving Range (XmR) chart was used. This chart provided a means to examine trends of weight losses and gains and associate those losses and gains with specific behaviors associated with them.

Using a control chart in this manner can be compared to any process which can be improved by either increasing or decreasing a measured characteristic (such as time, length, or weight). In this kind of effort, improvements can be

expected to cause shifts in the measured values, making it necessary to recompute control chart center lines and limits.

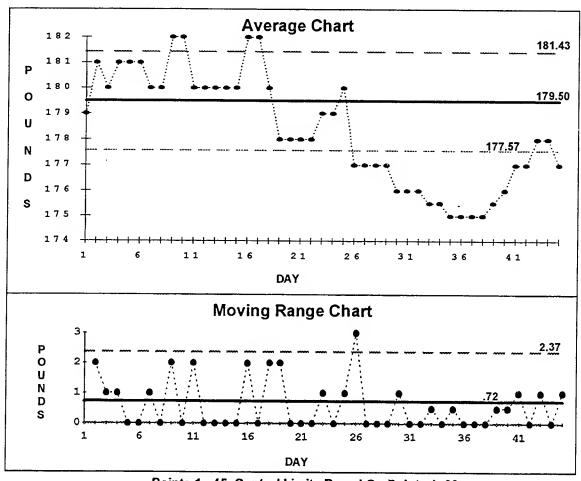
Sometimes the need to recompute is more obvious than others. In <u>Understanding Statistical Process Control</u>, Donald J. Wheeler and David S. Chambers indicate that control limits should be based on 20 to 30 data points or (for grouped data) subgroups, if possible. They also state that control limits should be changed based on changes in the process (229). Sometimes a change in a process is obvious, especially when the change was deliberate. But sometimes there are changes in a process that are not known until they appear on the chart in the form of an upward or downward trend or a series of out-of-control points.

It should be obvious that a deliberate change in a process triggers a control limit recomputation. Wheeler and Chambers allow that the new data can be plotted against the old limits until there are enough data points to provide reliable limits for the new process. They state that if the new data remains in control using the old limits, no new limits are needed (229).

An Example One Of Many Possible Solutions

The "bottom line" is that it becomes a judgment call when determining when a change in control limits is needed. While following the example provided in the following pages, there will be several points where this decision will have to be made. For the purpose of this study, the center line and control limits will be recomputed whenever 20 consecutive data points fall on the same side of the center line. This will allow the minimum recommended data points for the new limits, and will help reduce the chance of recomputing new limits just to have the data return to the original limits and mean. It also allows the user to continue to plot points against the old limits until there are enough data points to compute new limits (as Wheeler and Chambers allow in their book).

The following XmR chart contains the first 45 data points for the subject's weight control effort. The control limits are computed using the first 30 data points. These data points show a process that is not in control, but there is still a strong message here. Beginning at point 26, the data line drops not only below the mean line, but out of the control limits for 17 points. The next two points return to just within the lower control limit, then the next one falls back out again. This is a strong indication of a process change. Based on our recomputation criteria, we should recompute the control limits at this point based upon data

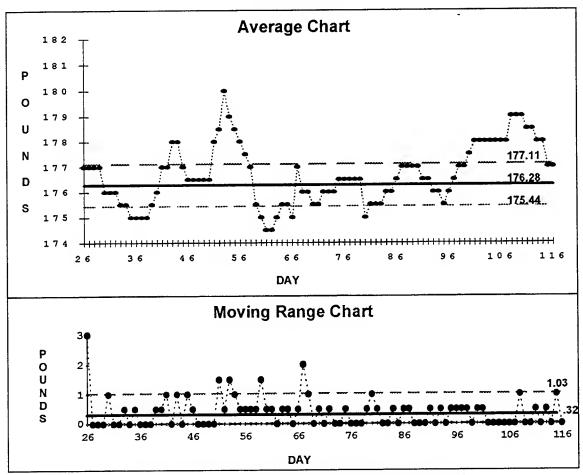


Points 1 - 45, Control Limits Based On Points 1- 30

points 26 through 45. This gives us control limits based on 20 data points.

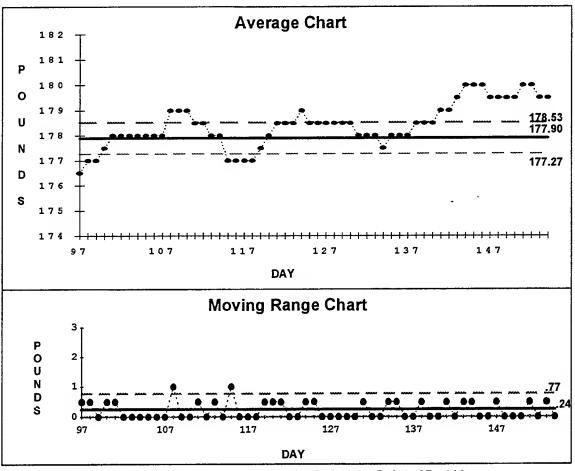
The next chart (shown on the next page) shows the data points from point 26 to the next recomputation point. point to make about this chart is the tighter control limits. This is due to a decrease in variation as demonstrated by the smaller average moving range (.31 as opposed to .72 in the previous chart). This decrease in variation could be caused by the subject's closer awareness of increases and decreases in weight, allowing him to adjust for changes. It is also expected that, as the subject's weight gets closer to his ideal weight, it will become harder to lose the remaining weight. It should also be noted that the process is still out of control. There are peals and valleys in this data caused by the subject's extra effort to lose weight (which results in the valleys) usually followed by eating binges (which result in the peaks). irregularity of this line of data indicates that there may be a combination of several short-term processes involved, none of which meet the needs of the subject (that need being the sustained loss of and stabilization of his weight). One

may be tempted to recompute the limits at point 41, but remembering the rule we set at the beginning, there must be 20 consecutive points on the same side of the center line to do that. There are only 18 consecutive points above the center line at this point, then the data plunges back below the center line, and actually below drops below the lower control limits for a few days. The first series of data points that meet our recomputation criteria runs from point 97 through point 116. The next recomputation will use this series of data to compute control limits.



Points 26 - 116, Control Limits Based On Points 26 - 45

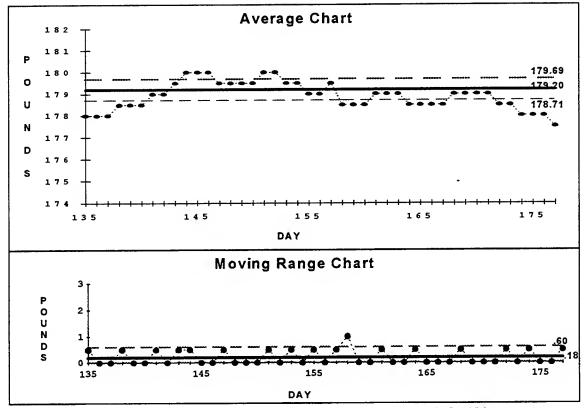
The next chart (shown at the top of the next page) indicates that the process is still not in control. The variation is still decreasing, but the data line continues to fall out of the control at both sides of the center line. The process seems to be creeping upward (the mean of the prior average chart was 176.28 as opposed to the current 177.90). The peaks and valleys do not extend as far outside the control limits as in previous charts. The data series triggering the next recomputation begins at point 135. The



Points 97 - 154, Control Limits Based On Points 97 - 116

twenty data points used to recompute the limits end with point 154.

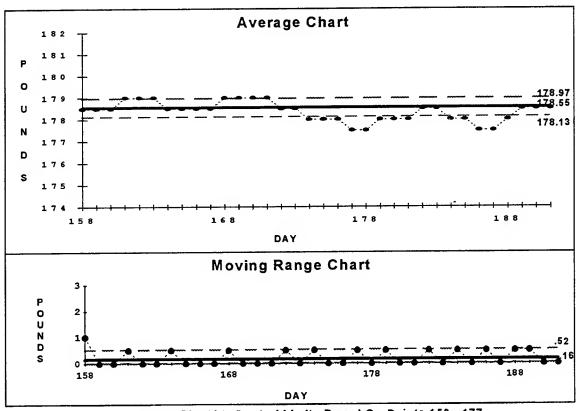
The next chart (shown at he top of next page) has even tighter control limits. There is barely a pound's difference between the upper and lower limits. This is the main contributor to the out-of-control situation that still exists. Except for the three points at the beginning of this chart and the four at the end, the points that fall out There does appear of control do so by a very slim margin. to be a downward trend once again starting at point 158. From this point to the end of the chart (which takes us to the next recomputation point) there is a fairly level data line followed by a sharp drop-off. It should be noted that at point 163 the subject began using a diet plan. The diet plan is one that uses a powdered drink mix for breakfast and lunch with a regular meal for dinner. After about a week on the plan, it appears that results may be appearing. 158 to 177 will be used to compute the limits for the next chart.



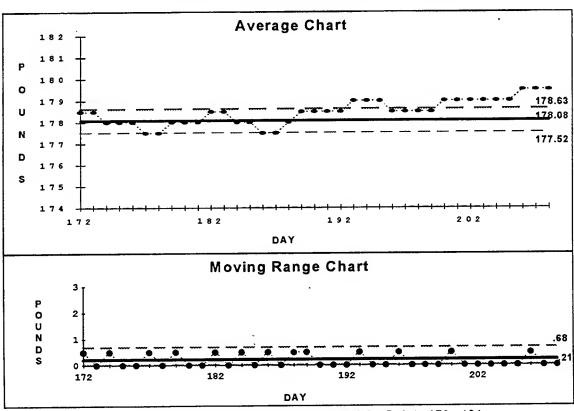
Points 135 - 177, Control Limits Based On Points 135 - 154

The chart shown at the top of the next page indicates another possible downward shift starting at point 172. From point 172 on, there are no points above the center line. This indicates that the process is now centered around a new mean, which will be computed along with new control limits using data points 172 through 191.

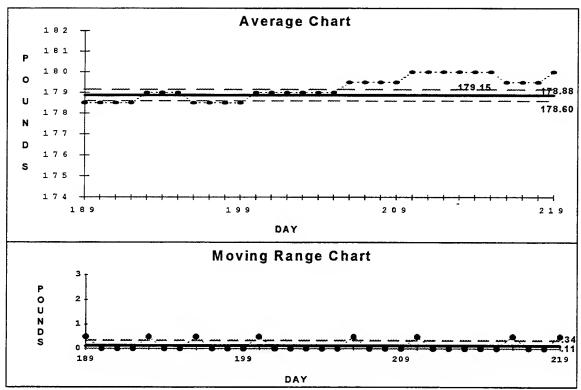
The chart at the bottom of the next page shows the results of this recomputation of control limits and mean. There appears to be an upward shift this time. The shift starts at point 189 and continues. From this point on, there are no data points falling below the center line. Based on the criteria we selected for recomputing control limits, we will now recompute limits based on points 189 through 208. The resulting control chart is shown below. It indicates another change in the process. This is another upward shift.



Points 158 - 191, Control Limits Based On Points 158 - 177



Points 172 - 208, Control Limits Based On Points 172 - 191

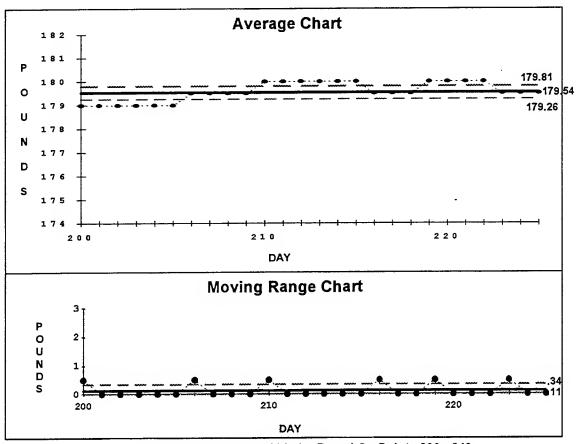


Points 189 - 219, Control Limits Based On Points 189 - 208

The chart at the top of the next page contains the remainder of the data points. This chart shows the last few points falling almost on the center line. It would be interesting to see if the data line stays there. It is more likely, based on the past data, that the data will soon fall outside the control limits - either on the high or low side. The data only has to vary by half a pound to fall outside the control limits.

Other Observations

During the course of this exercise, some other points about the use of control charts can be illustrated. These points, while not directly related to the limit recomputation question, are worth mentioning briefly. If one examines the control charts used throughout this paper, one will notice that the scale for all of the chart axes are the same. This was done to illustrate how dramatic the reduction of variation can affect control limits. On the early charts, the entire area of the charts



Points 200 - 225, Control Limits Based On Points 200 - 219

were covered by the data points. There was a range of almost 4 pounds between the X chart control limits. At that time, it appeared that rounding the weight measurements to the nearest half pound was accurate enough. Very quickly, as the variation was reduced, the range between the X chart control limits shrank to less than one pound. By the end of the exercise, the difference between the control limits were just over half a pound. Since the weights were being rounded to the nearest half pound, any variation at all would result in an out of control point. Obviously the measurements need to be taken on a much more accurate scale. Also the chart axes can be scaled to use more of the chart area and improve readability.

Summary

The example provided in this paper show only one way to address the question of control limit recomputation. The criteria used to make recomputation decisions should be tailored to the process that is being observed. The sensitivity of the criteria must be based upon the data that is being collected. The data should be collected at a level of accuracy that allows the data to vary to some degree

without indicating out of control points. When the control limits are recomputed, it is a good idea to reexamine the vertical axis scale and adjust the scale of the chart for readability. It can be just as dangerous to recompute limits too often as it is to not recompute them often enough. Deciding when it is appropriate is a matter of judgment. The more one uses control charts, and the more familiar one becomes with how they respond to changes in data, the more comfortable one becomes with their decisions concerning the mechanics of control charts. The best way to gain this confidence is to roll up one's sleeves and practice, practice, practice...

Works Cited

Neave, Henry R. The Deming Dimension. Knoxville: SPC Press, 1990. 229.

Wheeler, Donald J. and David S. Chambers. <u>Understanding</u>

<u>Statistical Process Control</u>. 2nd ed. <u>Knoxville: SPC</u>

<u>Press, 1992. 61.</u>

Reeingineering the Major Command Headquarters



Col James S. Seevers

Colonel James S. Seevers is Chief, Manpower and Organization Division, Air Combat Command, Langley Air Force Base, Virginia. Colonel Seevers is responsible for manpower requirements and resources, productivity programs, management engineering, and manpower planning for contingency operations for ACC units and ACC-gained Air Reserve Components.

Colonel Seevers graduated from Oak Glen High School, Chester, West Virginia in 1964. He received a bachelor's degree in Political Science from the US Air Force Academy in 1968, and a master's degree in Management Science from Louisiana Tech University in 1973. His military education includes Squadron Officer School, Armed Forces Staff College, and the Industrial College of the Armed Forces.

The colonel has served as a fighter wing intelligence officer, systems analyst for the Joint Strategic Target Planning Staff, executive officer to the Director of Manpower and Organization, Deputy Chief of the Chief of Staff of the Air Force Staff Group, Director for Manpower and Personnel (J1) for U.S. Pacific Command, and Commander of the Air Force Management Engineering Agency.

The colonel's military decorations include the Defense Superior Service Medal and Legion of Merit.

Reengineering the Major Command Headquarters

Colonel James S. Seevers Headquarters, Air Combat Command

Abstract

ACC's reengineering initiative resulted from our continuing effort to improve combat capability. In light of declining resources, we knew it was imperative to apply those resources to the leading edge of the command-our combat wings--while reducing demand for resources in the headquarters with no loss in our ability to support the wings. ACC is meeting that challenge with a combination of quality improvement and reengineering efforts. These efforts emphasize integrated teams, process improvements, and reduced overhead and support. Significant progress has been made in the initial efforts, while early experience will ensure even more success in the future. But changing long-standing processes and the relationships within the headquarters is not an easy transition. As we've seen in other aspects of quality improvement, reengineering requires a cultural change. A quality approach and reengineering share a common foundation that is both process-based and customer-oriented. But reengineering also focuses on fundamental rethinking and dramatic improvement. That change is more risky and more radical, but it is also more rewarding. The key ingredients for success in the future, as in the past, will be a strong commitment from leadership at all levels, and the development and empowerment of our people so they can effectively deliver solid, incremental changes as well as major breakthroughs in a climate of trust, teamwork, and continuous improvement.

Introduction

We must build a better headquarters, providing better support for our Wings and better products to the Air Force and Unified Commands, and we must do it with fewer people. We must do it to meet the challenges of declining resources and new world threats while continuing to provide the world's best combat air forces (6, 1).

General John M. Loh Commander Air Combat Command

That was the challenge--to improve both the effectiveness and efficiency of Air Combat Command headquarters. Our approach included a continuing emphasis on the ACC quality operating style and the application of reengineering principles. For us, reengineering was, and continues to be, an approach--not a panacea. The mere proclamation of reengineering, although a frequently used and equally often misused term, will not achieve results. It's not easy. Reengineering is much more difficult in practice than in theory, but we're making progress in ACC. This paper is a travelogue of the early days of our journey.

Our Roadmap: The ACC Approach to Reengineering

There are many reasons to launch a major reengineering effort. ACC's effort resulted from our focus on combat capability. In light of declining resources, we knew it was imperative to apply those resources to the leading edge of the command--our combat wings--while reducing demand for resources in the headquarters with no loss in our ability to support the wings.

In June 1992, the Air Force established Air Combat Command as the management headquarters for all conus-based combat air forces, and as the proponent for mission area analysis, requirements determination, and program management for all operational combat air forces, world-wide. Like any corporate headquarters, ACC is focused on strategic planning, policy development and deployment, resource advocacy and allocation, and performance evaluation. The only differences between our headquarters and the headquarters of a major corporation in the private sector are our products and our customers. That distinction is captured in the ACC mission statement:

Air Combat Command Professionals Providing the World's Best Combat Air Forces Delivering Rapid, Decisive Airpower Anytime, Anywhere

The reductions in force structure ACC experienced during its first two years combined with the prospect of additional cuts in the future, made change in the command headquarters inevitable. From activation in 1992 through the end of fiscal year 94, ACC had reduced, through transfers, base closures and realignments, and force structure reductions, almost 45,000 people--25% percent of the command's strength. Through the end of 1995, that number would grow to over 56,000 (a 32% reduction). Following the Air Force sizing model for MAJCOM headquarters based on 2 percent of the command population, this change would precipitate a 27 percent reduction in the headquarters--a cut of more than 850 people with little loss in existing responsibilities and additional requirements resulting from ACC's new role as air component to a greatly expanded U.S. Atlantic Command (USACOM).

Responding to this challenge would involve everyone in the headquarters, but most of all, it would require strong leadership from the very top of the organization. General John M Loh, Commander of Air Combat Command (COMACC), defined leadership as "... the art of creating a working climate that inspires others to achieve extraordinary goals and levels of performance." (1, 33) Reengineering needs that climate to be successful. The major leadership challenge associated with reengineering is to change the organization's culture--to recognize the structures and management styles that made us the world's best combat air force must change for the future. ACC had the leadership commitment to meet the challenge.

COMACC was determined to limit the adverse impact of arbitrary reductions in the headquarters. In fact, many saw it as an opportunity to reexamine basic headquarters processes and relationships in order to protect, and hopefully increase, effectiveness while reducing ACC's overhead. However, some also perceived it as a potential loss of control over their own resources and their authority to carry out assigned responsibilities. In light of the opportunities and the

concerns, a game plan was developed to focus the energy and resources of the headquarters toward those goals. The plan immediately acknowledged that a traditional fair share or "salami slice" allocation of reductions was contrary to the command's goals and would be employed only as the last option. Instead, COMACC charted a Process Analysis and Resizing Team to operate under the guidance of the Vice Commander and determine the means to accomplish headquarters resizing goals. The temporary structure created to facilitate this effort is shown in Figure 1.

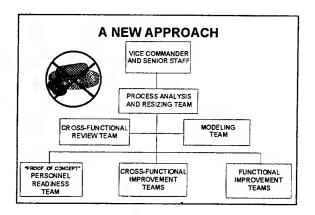


Figure 1. Reengineering Teams

David Osborne, in Reinventing Government, emphasized the need for organizations to change. He stated, "Hierarchical, centralized bureaucracies designed in the 1930s and 1940s simply do not function well in the rapidly changing, information-rich, knowledge-intensive society and economy of the 1990s" (8, 12). A principle role of leadership is to cultivate the focus on the mission and apply the benefits of changing technology. COMACC and the Vice Commander also identified the need to pursue empowered work teams as a means of enhancing headquarters effectiveness by ensuring our focus on the mission took priority over our focus on individual functions. Jim Lundy, the author of Lead, Follow or Get Out of the Way, observed, "The effective leader constantly works to cultivate the individual's commitment to the organization by demonstrating that the real team to which an individual belongs is more than just his section, department, or division" (7, 19).

The Vice Commander led the way by encouraging headquarters-wide support and cooperation. He said, "this is an opportunity to change our organizational paradigms, improve our headquarters level processes, and use the quality approach to our advantage as we adjust organizations, functions, processes, and sizing." (2,1) He also chaired several strategy sessions with the staff directors, and most of the discussion addressed evolving organizational approaches and the use of empowered work teams. The potential benefit of these teams, frequently called integrated product or process teams, directly related to our analysis of cross-functional processes.

In order to thoroughly assess headquarters' activities, our objective was to "peel the onion"--to strip away overhead and staff support activities in order to focus on basic work processes (Figure 2). Quality tools and techniques were used effectively to both analyze large amounts of data reflecting over 1500 processes and prioritize headquarters improvement efforts. One of the more effective tools was Pareto Analysis. Analysis showed that just over 80 percent of headquarters personnel were spending their time on approximately 20 percent of the

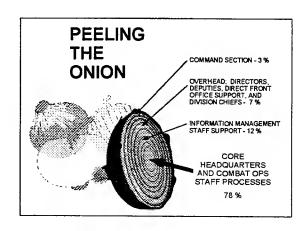
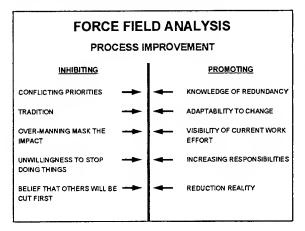


Figure 2. Focusing on Core Processes

processes. In fact, the top twenty cross-functional processes (processes involving more than one directorate or functional area) accounted for approximately 60 percent of the man-years expended.

But before we tackled the most time-consuming processes, it was important to anticipate factors which could either promote or inhibit process improvement and facilitate the application of empowered team concepts. The Process Analysis and Resizing Team forecasted factors and displayed them in the force field analysis charts at Figures 3 and 4.



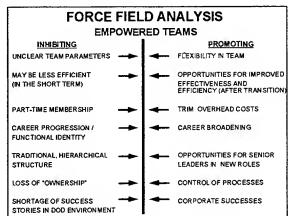


Figure 3. Process Improvement Factors

Figure 4. Empowered Team Factors

Reengineering with Integrated Teams

COMACC and the senior staff directed that any changes to the basic organizational structure would be an evolutionary process, rather than a revolutionary change. Hammer and Champy also recognized that reorganization could not replace fundamental reengineering:

Reengineering also is not the same as reorganizing, delayering, or flattening an organization, although reengineering may, in fact, produce a flatter organization ... the problems facing companies do not result from their organizational structures but their process structures. Overlaying a new organization on top of an old process is pouring soured wine into new bottles (3, 48).

The Integrated Product and Process Team (IPT) concept was one of the evolutionary changes that grew from our combined focus on customers, cross-functional processes, and the potential for more integrated working relationships. Scholtes cites teamwork as part of the natural quality evolution: "As organizations become more involved in the quality movement, they discover the benefits of having people at all levels work together in teams" (9, 1-17). In the past, we brought people together for a Site Activation Task Force (SATAF) or a unit assessment, such as our Quality Air Force Assessment (QAFA) Teams. In some cases, we permanently assigned them to one organization. That was the case in our Systems Management Offices (SMOs) and in our Inspector General organization. We were now expanding that concept.

The Vice Commander chartered a proof-of-concept effort to establish an integrated team. That effort addressed the establishment of a Personnel Readiness Team (PRT) to bring together all the

people involved in sourcing personnel for worldwide contingency operations. The Personnel Readiness Team (PRT) was activated on 1 November 1993. Team members are trained by, and previously worked in, functionally-aligned organizations throughout the staff. Now they are a single team, under a single leader, and focused on a specific product in direct support of the ACC mission. People who previously served in operations, logistics, personnel, and many other functions throughout the headquarters now work for the same leader, with the same focus. On the team, the members continue to grow. They gain experience and develop expertise in new functional areas. They become "multi-skilled" much like the Rivet Workforce concept, and they will be more valuable leaders in the future because of that experience.

The PRT was the first of many new integrated teams to improve our processes, enhance communication and coordination, reduce resource costs, and most importantly, improve products and services to our customers. The reengineering effort identified five additional teams to evaluate and expand the concept (COMACC Memo).

The first two, Combat Rescue and Theater Battle Management IPTs, are product oriented. They provide an opportunity to establish "cradle to grave" headquarters support, from strategic planning through resource allocation, for a given mission area capability. Options evaluated for the Combat Rescue Team (Figure 5) show the potential spectrum of team authority, responsibility, and accountability. This concept can potentially expand to other major mission areas in support of our customers: the warfighting CINCs and our operators in the field.

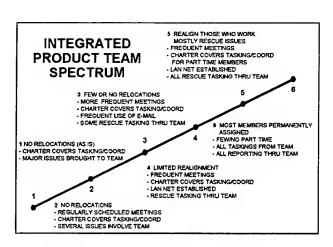


Figure 5. IPT Range of Operations

The changing environment brought renewed emphasis on the relationship between Air Combat Command and its primary customers. It also provided a basis for the three additional teams. The first, a Component Action Team, was intended to address support provided as the air component to U.S. Atlantic Command. With the activation of USACOM on 1 October 1993 came new challenges to each of the Service components. The new command was given a greatly expanded mission which now included adaptive joint force development and training for a wide range of missions including non-traditional application of military capabilities in support of civilian authorities and humanitarian relief efforts. The continuing evolution of this new command delayed full evaluation of the integrated team approach, so the effort to evaluate the means by which an integrated team could improve responsiveness to our joint commitments is still under development.

At the same time, pressures to down-size and reduce the command's budget brought a renewed emphasis on the vital link between long-range strategic planning and near-term resource allocation and budget execution. Another team would bring together all activities on the staff related to the Planning, Programming and Budgeting System from strategic planning through budget execution-a PPBES Team, with the "E" represented budget execution. PPBES was an initiative to link all

activities focused on the future of the command and the Air Force's combat capability, including mission area analysis, planning, operational requirements and prioritization, and programming.

The third additional IPT addressed support for wing-level activities. After implementation of the objective wing structure, we saw three of the four groups at the operational level (Operations, Logistics, and Medical) benefiting from the support of a single focal point in the headquarters. However, the Support Group was supported by six separate, functionally aligned directorates. Force structure reductions, realignments, and restructuring of our wings reinforced our need to ensure the headquarters was providing the best support for all wing organizations with balanced resources. The Base Support Team was established to address policy and resource advocacy in direct support of Support Group Commanders. Early benefits fall into areas of readiness training, infrastructure, systems integration, financial planning, and human resource development. It is premature to determine whether the formal organization should parallel the IPT--that assessment will require more data and analysis--but it is clear the relationship between the headquarters and its support group customers will benefit from an integrated team approach.

These IPTs are designed to be permanent teams, not just committees. Committees tend to add layers to the organization and add time to the processes. Integrated teams should reduce layers and take time out. Structured the right way, these teams will work in partnership with the functional organization, and they will take advantage of information sharing--another benefit of rapidly evolving technology. They do not replace the more traditional functional focus of most of our

directorates--they complement that alignment and improve overall effectiveness. Figure 6 displays the basic support provided to team members and outlines the relationship between teams and functional directorates. Teams are focused on major products and services the headquarters contributes to the mission. Functionally-aligned offices continue to train and prepare prospective team members, and directors of those offices continue to provide support, including resources, training, and facilities, for teams where the preponderance of a team

for teams where the preponderance of a team's interest falls within their area of responsibility.

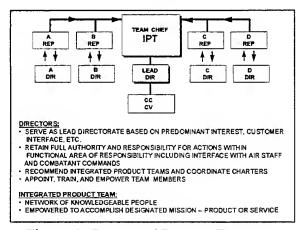


Figure 6. Integrated Process Teams

Functional managers become the coaching staff--assessing the opposition, developing the game plan, preparing the players, ensuring they have the right equipment and resources, and continually assessing performance in order to be even better in the next encounter. Our players will continue to carry the ball for us both on the staff and in the field.

Reengineering with Process-Based Improvements

In addition to IPTs, Quality Improvement Teams (QITs) were established to address the top twenty cross-functional processes and identify potential areas for streamlining the processes; reducing time, work, and resource requirements while identifying additional areas for integrated teams. Figure 7 shows those top twenty processes and the associated man-years as determined by the current level

of effort expended throughout the staff. Hronec, in his book, <u>Vital Signs</u>, also recognized the importance of focusing on cross-functional processes:

Traditional organizational charts ... show only the vertical reporting relations of the various functions in the organization. Yet, organizations serve customers through processes that cut across functions. If management focuses only on functional performance, overall results will be suboptimal

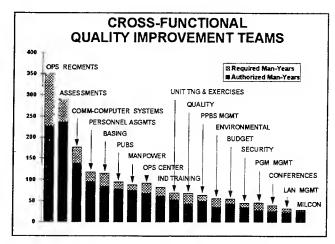


Figure 7. Quality Improvement Teams

because each function develops goals and performance measures independently ... Therefore, to truly understand and improve an organization, one must focus on its processes (4, 108)

The QITs focused on processes, and in several cases, they were immediately successful. They found ways to improve both effectiveness and efficiency in headquarters processes, and they successfully obtained support for implementation from stakeholders as well as process owners. Some resulted in consolidation of support activities such as staff training, local area network management, and conference support, while others addressed realignment of responsibilities and improvements through automation such as manpower management and personnel assignments. Others provided a beginning rather than an end. In the assessments area, the QIT provided a solid foundation for additional work by the Inspector General staff for dramatically changing ACC's approach to unit assessments. And the extensive review of program management set the ground work for improved linkages in major headquarters processes from strategic planning through resource allocation.

In addition to these cross-functional teams, several of the directors launched improvement efforts within their respective functional areas. The Director of Logistics formed parallel QITs to tackle potential improvements within the directorate that would support and enhance cross-functional initiatives. The Civil Engineer adopted a "back to basics" approach to evaluate, in detail, the relationship between headquarters processes and related activities in a field operating agency in support of base-level civil engineering functions. The Director of Personnel adopted a similar approach to chart and analyze core activities, and reduce time, work, and resource costs. The Director of Plans and Programs realigned responsibilities to address growing issues such as intercommand relationships, strategic planning, and doctrine development. This realignment resulted in a reorganization at both division and branch levels. The Surgeon General employed reengineering concepts to challenge the basic alignment of core functions in order to streamline processes and relationships both internal and external to the directorate. Others followed, and the reengineering effort had begun to spread throughout the headquarters. The encouragement and support of senior leaders was beginning to create the climate where new ideas could flourish.

Reengineering Overhead and Support Staff

Reengineering efforts also addressed overhead and staff support activities. Quality leadership and reengineering efforts recognize the importance of reducing organizational layers and streamlining support staffs in order to place the focus on people with direct contact to, and providing service for, our customers. Reducing overhead and support becomes even more important in a period of down-sizing. Variability was another dimension of overhead and staff support considered. Just as we investigate process control to determine explained and unexplained variability, we did the same for overhead and support staff. Where there was no overriding rationale for differences, we applied a standardized staffing pattern.

This pattern delayered the organization by spreading the span of control. Span of control requirements change in quality organizations. Hammer and Champy states that "while a manager can typically supervise only about seven people, he or she can coach close to thirty. At a one to seven manager-to-worker ratio, an organization is of necessity hierarchical. At one to thirty, it is much less so" (3, 79). We found 40 percent of the headquarters divisions consisted of less than 20 people while sizes ranged from a low of 3 to over 130. We eliminated small divisions while establishing a policy of working branch chiefs, creating only two levels of management between COMACC and the process workers: director and division chief.

The staffing pattern also reflected the yield on our investment in information technology. Some elements of an organization's infrastructure, if put in place before reengineering, can smooth and speed the implementation. One such element is information technology (3, 116). ACC headquarters use of a local area network (LAN) experienced unparalleled growth that helped set the stage for reengineering. Headquarters LAN users grew from approximately 800 in April of 1993 to almost 2500 by the end of the year, and we are still expanding. To take advantage of this technology, the Commander's Executive Officer led a QIT to develop a system that virtually eliminated paperwork within the headquarters. Action officers now prepare decision packages for COMACC approval that are never printed on paper. From action officer to the Commander (with full coordination) and back, all within the LAN. Our investment reduced information managers while ensuring a consistent level of support across the staff. The staffing pattern reflected a support ratio of one information manager for every ten people supported at division level and below, a change from an average of one for every 7.8 and a variation in the number of people supported that ranged from 4.5 to almost 16.

All of the initiatives described above contributed to identifying more than 300 positions for future reductions during the first five months (June - November 1993). The results are shown in Figure 8.

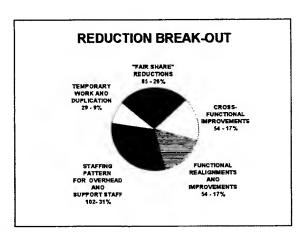


Figure 8. Impact of Early Actions

Reengineering Lessons for Continuing the Journey

Throughout the early portion of our reengineering journey, initiatives received a high level of command section support. The key to success in the future will be a continuing leadership commitment at all levels. Some will look for immediate solutions, but change is neither quick nor easy. Lundy cited Tolstoy's keen insight when he repeated, "Everyone wants to change humanity, but nobody wants to change himself" (4). Some immediate success will come, as we have already seen, but efforts of this size also require a large initial investment—in data collection, in self-inspection, and in cultural adjustment. The Vice Commander referenced this investment when he said, "...a large front-end investment is not unusual for an effort of this magnitude. Initial assessments by representatives from every functional area continue to pay dividends as Directorates build on that investment with additional process analysis and improvement" (10, 1).

Our early projections of promoting and inhibiting factors were validated by our experiences. Figure 9 shows a revised force field analysis. We will pursue several specific improvements, including better data upon which to base key reengineering decisions and a continuing effort to better define, and better communicate, a clear vision of a future ACC headquarters. We recognize good analysis takes time, but too much time can lead to "analysis paralysis." The objective is a quick and responsive evaluation with sufficient information to reduce risk and contribute to constructive change. We

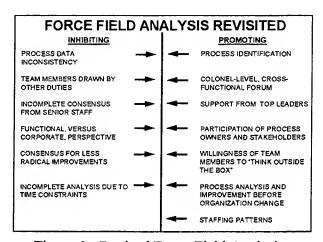


Figure 9. Revised Force Field Analysis

can better achieve that objective with increasing "hands on" participation by the senior staff--to identify high-payback areas for expanding the use of integrated teams and continue to improve core processes (as well as eliminating those that have outlived their contribution to our customers).

In many cases, integrated teams are a better way to organize--to complement, not compete with, more traditional structures. They can be more responsive to customers and a smarter way to work day-to-day issues for more effective and efficient mission accomplishment. As Osborne stated, "Missions do not respect turf lines. The solution is to reorganize around missions, not turf. To imprint the mission of an organization on its members, leaders build a culture around it. They articulate their values and model the behavior they want" (8, 132). That is just what ACC leaders are doing.

Team members are trained and empowered by respective functional leaders to handle the projects we work everyday. That provides more time for the senior leaders--our ACC Board of Directors--to focus on strategic planning, and develop our people and our combat capability to meet future challenges. The fully-implemented Personnel Readiness Team and the five additional teams being evaluated (Combat Rescue, Theater Battle Management, Base Support, PPBES, and Component Action) provide the foundation and potential for a wide variety of future teams.

Changing basic processes and relationships within the headquarters is not an easy transition. As we've seen in other aspects of quality improvement, it requires a cultural change. A quality approach and reengineering share a common foundation that is both process-based and customeroriented. But reengineering also focuses on what Hammer and Champy call "fundamental rethinking" and "dramatic improvement" (3, 32). And sometimes that change is more risky and more radical, but it is also more rewarding. General Loh addressed this complementary approach:

While we must continually find new and better ways of doing things, we must also look for major break-throughs--game-winning home runs as well as solid base hits. In some cases, we will design and execute new and different processes, not just do the old processes differently (6, 2-3).

The key ingredient for success in the future, as in the past, will be the development and empowerment of our people so they can effectively deliver solid, incremental changes as well as major breakthroughs in a climate of trust, teamwork, and continuous improvement.

Works Cited

- 1. ACC Quality, LangleyAFB, Virginia: Air Combat Command, 1993.
- 2. Croker, Stephen B. ACC/CV Letter to HQ ACC Staff, "ACC Headquarters Resizing Meeting (#5)," 14 June 1993
- 3. Hammer, Michael, and James Champy. <u>Reengineering the Corporation: A Manifesto for Business Revolution</u>. New York: Harper Collins Publishers, Inc., 1993.
- 4. Hronec, Steven M. <u>Vital Signs: Using Quality, Time, and Cost Performance Measurements to Chart your Company's Future</u>. New York: American Management Association, 1993.
- 5. Loh, John M. ACC/CC Letter to HQ ACC Staff, "Reengineering the Headquarters," 11 February 1994
- 6. Loh, John M. ACC/CC Policy Paper, "Reengineering Air Combat Command Headquarters," 11 February 94
- 7. Lundy, Jim. Lead, Follow, or Get Out of the Way. New York: Berkley Books, 1991.
- 8. Osborne, David, and Ted Gaebler. <u>Reinventing Government: How the Entrepreneurial Spirit is Transforming the Public Sector</u>. Reading, Massachusetts: Addison-Wesley Publishing Company, 1992.
- 9. Scholtes, Peter R., et al. <u>The Team Handbook</u>. Madison, Wisconsin: Joiner Associates, Inc., 1988.
- 10. Wolfe, Thad A, ACC/CV Memorandum to HQ ACC Staff, "ACC Headquarters Resizing for FY 95," 14 March 1994

Strategic Planning – A View of a Room…or a Room with a View



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STRATEGIC PLANNING--A VIEW OF A ROOM . . . OR A ROOM WITH A VIEW

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Abstract

All she wanted was a room with a view. A small thing to ask on her first trip to Florence. Little did she realize that her wish would lead her into impropriety, confusion and--most scandalous for a well-reared Edwardian girl--passion!

A vision is a view of the future that can be shared.² Its importance in public sector organizations is vital because public organizations are created by legislative action or other initiative to focus on a need, mission, or function, not a vision. Over time, these functions become "bureaucratized," inflexible, and self-sustaining, particularly if they are successful.

The danger is that these organizations will become incapable of responding to a changing world order. For Federal agencies whose mission and visions do not directly "reach out and touch" the customers (e.g., DOD and NASA), leaders must define their "strategic intent," that force that drives the organization toward its vision. The quality of the vision depends upon whether the leaders have a room with a view (an external focus) or a view of a room (an internal focus).

But, a vision alone is insufficient to move the organization towards its future. That's why the strategic planning process is so important. This paper describes the participation required of all the top leaders in an organization to develop explicit goals that form the basis for everyone in the organization to take action.

Background

Leadership approaches to quality management abound. The approach can differ in many ways (e.g., the relative importance the leader places on teams, external customers, data collection,

¹Movie advertisement from A Room with a View.

²Leonard D. Goodstein, Timothy M. Nolan, and J. William Pfeiffer, <u>Applied Strategic Planning</u>, <u>A Comprehensive Guide</u> (San Diego: Pfeiffer & Co., 1992).

or having a strategic plan) but the intent is usually the same, to increase an organization's productivity and reduce its costs through improving quality. While committed leadership is essential for success, what does that mean?

Commitment can manifest itself in many ways. One, characterized as **leadership-dependent**, succeeds through sheer force of the leader's personality. The second effort is **leadership-driven** and succeeds because the leader understands the necessity to put in place an infrastructure to support the quality efforts. As a result, the organizational culture—the way things get done and the way values are transmitted to new people—will change. The quality movement depends on strong leaders, leaders with a vision who are willing to accept that fact and its implications, that some of their greatest accomplishments might not take place "on their watch." It takes courage and commitment to understand the long-term orientation.

In today's environment of faster, better, cheaper solutions, we tend to trivialize the visioning process. Typically, we think of the inspired leader as the person who initiates and communicates the vision of an organization or community. The problem is that many leaders believe that is all they need to do, that culture will change through leadership words. To change the culture of the organization, however, requires the cumulative experience of everyone in changing behaviors and seeing different outcomes.

Women like looking at a view, men don't. My vision is within. Here is where the birds sing. Here is where the sky is blue.

The elder Mr. Emerson³

A View of a Room

Clearly, the elder Mr. Emerson, like some of our leaders, would subscribe to an internal focus. We agree that while a leader must examine his or her own values and planning assumptions, the vision which results from this examination will only be valuable if the world is not changing, which is certainly not the world the military lives in. Regardless, the vision is meaningless unless it is communicated to everyone.

Some Department of the Navy leaders have engaged in strategic planning and report that the experience leaves their organization unchanged. When the planning process was challenged, it was usually determined that the process, itself, was not completed. That is, the planning team developed a vision, mission, and guiding principles and then, because they didn't know how to translate these foundations into strategic goals, strategies and objectives, the efforts of the planning team simply dissipated and the team abrogated the process. Leaders equated "strategic" with "off-site fuzzy thinking" and experience.

³ Room with a View.

We tell leaders we consult with, that if they produce a vision, guiding principles, and a mission, and do not work through the gap analysis to produce the goals, they have simply produced "wallpaper," posters they can frame and hang on the walls. Without goals, there is no implication for action in the organization. The "view" will not change.

He has rooms he does not value [and so was willing to change them].

Mr. Beebe⁴

A Room with a View

It is difficult to describe a room with a view because a view is limited only by our ability to describe it.

We see the world we can describe; we don't describe the world we see.

Peter Senge⁵

Strategic planning is an attempt to describe the future. The vision is what the organization will look like. The guiding principles describe the behavior needed to achieve that future, and the goals describe the changes that must occur to move the organization from its current state into the idealized future. This is why a "vision" with a view is so difficult. Even though leaders who are really strategic, systems, and nonlinear thinkers see the big picture interconnections, multiple cause-and-effect interactions, and implications of change, they have difficulty articulating what they see in their mind's eye. Smart facilitators and coaches need to tease this out. Otherwise the room can become a confined space--with the walls moving in.

Perhaps articulation is only part of the issue. Visionary leaders who "see the view" may become anxious or fearful because of the magnitude of the changing world order and retreat to the safety of their warm, comfortable, sun-lit rooms. Consultants describe resistance by managers to change as if it were an identifiable, understood, and easily treated disease. Maybe that's why leaders and managers aren't given more respect and understanding. Why do we believe managers know how to cope with change? Where do they learn it? They need help changing their view on knowing what to do and dealing with the enormity of the issues.

If the organization is, indeed, changing, the plan will never be perfect because the organization is not static. The true learning organization will understand this.

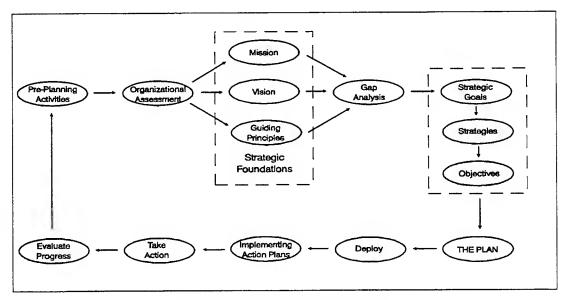
⁴ Room with a View.

⁵Peter Senge, keynote speaker, Seventh Annual National Conference on Federal Quality, Federal Quality Institute, Washington, DC, July 14, 1994.

My father says there's only one perfect view and that's the view of the sky over our heads.

George Emerson⁶

There are guideposts and help in the strategic planning process that the Department of the Navy uses.



Strategic Planning Model

What is not captured in this "process" on paper is the dynamic, iterative nature. It begins with pre-planning activities designed to prepare the senior leaders of an organization for strategic planning. These activities, which use primarily a structured interview process, focus on gathering data about the organization and assessing the current state of the organization. The richness of the data and the opportunity for leaders to express their concerns, perhaps even anxieties, with

⁶ Room with a View.

nonattribution are extraordinarily important. The interview data and an executive summary are formally presented back to the leadership team. The usefulness of this process cannot be overemphasized, nor can the work!

Then, in a workshop setting, senior leaders are actively engaged in the process of strategic planning. Through a consensus-building process, they develop the vision, mission and guiding principles of the organization. These elements are the strategic foundations, necessary to drive development of the strategic goals, strategies and objectives, but by themselves are insufficient. In order to develop the goals, strategies and objectives, the senior leaders go through a gap analysis which is simply the identification of what needs to be changed to move the organization from its current state to the desired future state. While the workshop itself is structured, the leaders (who have moved before with trepidation) can engage in expansive discussions about the future of their business.

Typically, the vision, mission, guiding principles, strategic goals and some strategies and objectives are developed in a 3-day workshop. It is after this workshop that senior leaders will enlist the help of others in the organization to assist in completing the strategies and objectives. Once these six elements have been developed, the leadership publishes the plan and deploys it throughout the organization. Action plans are developed and implemented by personnel throughout the organization. Implementation efforts are monitored and measured so that the organization can evaluate progress toward achievement of its goals, strategies and objectives.

Information from this evaluation is used as input to the next iteration of the strategic planning process where the strategic plan is validated and updated based on changed conditions. After all, strategic planning is leadership's job.

It is not the staff's job and it is not the customer's job. Some quality executives have suggested that a vision, mission, and values must be customer-driven. We agree to the extent that every organization exists to serve some customer base, and clearly, the organization must know who that customer is, and what the customer wants and needs. But, it is leadership's job to focus the efforts of the organization on meeting current requirements and thinking, strategically, about the requirements of the future. And only they understand and can define the values of the organization—the decision—drivers—that must come from inside.

Usually, customer feedback centers on telling the organization how to improve its current products and services. Customers ares not thinking about the future of the organization. They simply want products and services that add value to their lives.

In theory, strategic planning should be done at the highest levels and cascade down into an organization. In fact, it's not always done that way. Sometimes leaders are hesitant to engage in strategic planning if their own leadership has not developed a strategic plan for the parent organization. If leaders believe that they have the ability to control or at least strongly influence

⁷Tina Sung, "The Big Picture," Seventh Annual National Conference on Federal Quality, Federal Quality Institute, July 11, 1994.

the future, or perhaps even the boss, they can put a stake in the ground wherever they are and get started. That is where courage may be required.

Mrs. Yvonne Harrison is one Department of the Navy leader who did just that. As a newly appointed Deputy Assistant Secretary of the Navy (DASN) for Force Support and Families (FSF), Mrs. Harrison started her planning efforts with her immediate staff of five. Their initial efforts can be characterized as planning A View of a Room, dealing primarily with internal staff issues, but, in the process, the staff learned the technique and value of the strategic planning process. They also became more brave and gained confidence in their sphere of influence.

Their second effort, a few months later, was directed at planning for the multitude of programs under the purview of the DASN FSF. Using the process described above, the DASN and her staff developed their vision, guiding principles, mission, goals, strategies and objectives. Then, they took their draft plan to the community they serve, the Navy and Marine Corps program directors.

Mrs. Harrison and her staff presented the draft and solicited input on the goals and how to accomplish them. Both the Navy and Marine Corps communities responded enthusiastically to the work that had been done, providing additional strategies and objectives. Currently, the communities are working together to implement their mutual goals. No one can remember when this was done before in this way.

The Lessons

The Secretary did not have to do this planning. There was no requirement.

She personally directed and participated in the effort, i.e., it was leadership-driven.

She started small, shared her vision and guiding principles, and built upon the effort until the entire community was engaged in planning and implementing the changes.

Because they have defined their strategic intent, the FSF organization is better positioned and is, in fact, responding to a changing world order, at least as it pertains to their world.

Summary

Leaders throughout the Department of the Navy are engaged in strategic planning. Of equal importance to the plan may be the outcomes which are derived from the process: teambuilding among senior leaders, making explicit implicit organizational values, organizational alignment, breaking down barriers, and agreement to work together for the overall aim of the organization. Done correctly, strategic planning provides the leadership with a decision-making model and virtually ensures that the organization which was created by legislative action to accomplish an assigned mission cannot become bureaucratized, inflexible or self-sustaining. The leader may start with a View of a Room, but the successful leader will move to A Room with a View.

As long as [the Navy SEALs] keep asking themselves, "Who are we?" they will continue to find an important role to play in the nation's defense. If they ever find their niche and sink comfortably into it, their usefulness will be at an end.8

⁸Kelly, <u>Brave Men Dark Waters, The Untold Story of the Navy SEALs</u> (Pocket Books, a division of Simon & Schuster, New York, 1992) 293.

Comparison of "Views"

Characteristics of a View of a Room

Characteristics of a Room with a View

Focus

Internal

External

Vision

Operational

Strategic

Source

From the head; safe

From the heart; courageous

Purpose

Plan

Process

Participants

Staff

Community

Customers

Internal to the organization

External to the organization

Planning

assumptions

Controlling

Influencing

Boundaries

Rigid; well-defined

Semi-permeable;

expansive

Goals

Vertical

Horizontal

Outcome

Minimal or no change

Transformation

Thinking

Linear; simplistic

Interactive; systemic

Strategic Planning and Implementation: Planning To Plan Lessons Learned From The 89th Airlift Wing



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Some examples might be: when people who perform the work or the processes that support strategic goals join the planning team to brief them on current state performance versus desired state. The ensuing gap analysis may inspire other team members to tell the process experts how they *should* be doing their job. Maintaining respect for individuals' expertise while questioning thoughtfully is one of many delicate aspects of strategic planning that can be disarmed before it happens by preparation in the planning to plan stage.

Developing an agreement on the boundaries of prescriptive feedback could be one approach to managing the human issues of a changing team.

The 89 AW planned on using feedback brought in by the areas' respective commanders. If more clarification was required we would then invite appropriate individuals in to answer specific questions. We had already realized, through our work to date, that building our strategic planning team and sharing information with the team members and the people they represent was an important part of effective strategic planning. With so much information being passed along during the initial stages, agendas and meeting minutes became crucial to our team functioning. To ease our team through the different stages of team building, we focused on the strategic planning process itself and planned interventions for potential process breakdown.

We found our strategic planning process is conducive to team building because we had integrated it with the Seven Management and Planning tools mentioned earlier. These tools promote interaction among team members, allow the initial tension of a team to be dissipated, both while building group cohesion.

Our planned team building interventions included ice breakers, communication and group dynamic exercises. We also administered the Myers-Briggs Type Indicator (MBTI). The MBTI was extremely valuable because it helped us to break down barriers among team members by giving them an understanding of the strengths and weaknesses of each member.

The current performance data that will serve as the basis for your plan

We have already mentioned the need for current state performance measurements. If current performance data are not available, they must be obtained in order to complete your strategic planning. Since data collection is a time consuming process, there is no time like the present to start collecting. If you begin obtaining current state data in advance of your strategic planning, you will have less of a delay waiting for your metrics.

Collecting data is not a casual endeavor; it requires a well thought out and documented plan. It is important to consider what questions you want your data to answer. Some questions your data collection plan should answer are:

- What variables you need to track?
- What tracking process will be most effective?
- What time frame is necessary to obtain a true picture from your data?
- How will you display your data for accurate analysis?

The 89AW had already been collecting data and we felt confident in our metrics. We were trying to measure constant improvement and growth. During this planning phase, however, we began to realize that our metrics were driving our strategic planning. We had been using the data we had historically gathered without revisiting our data collection plan to determine what variables actually needed tracking. When planning to plan, we realized we need to measure our critical, mission-related processes first.

Summary of lessons learned

Planning to plan is an invaluable step of strategic planning that helps your team accomplish the planning process in the most efficient and effective manner. The 89th AW experienced a cohesive planning team, though the members were diverse and the group was somewhat large (10 people), because they invested in *planning how to plan* for their organizational planning. The education the wing received during this process is already helping them think about how they go about their work and their mission in a new and more integrated way.

The 89 AW learned that the strategic planning team should consist of the top leaders of your organization with support from process experts. The team should be supported by a facilitator and a process guide (an individual who is familiar with the strategic planning process). By using this method, the facilitator can oversee the group dynamics, allowing the process guide to concentrate on the plan's development.

Team building is very important; not only does it help in the short term by accelerating the process, but it becomes crucial over the long-term life of the plan. The 89 AW learned this long-term benefit through having team members reassigned and being able to easily integrate new members.

The MBTI or other personality type instruments are good tools if they are presented properly and in a nonthreatening, nonjudgemental way. They assist the team in identifying members' strong points. We have seen them used very effectively at the 89 AW, i.e., one tactical planning team used their member with strong fact gathering skills to handle their data gathering.

Training and common terminology are helpful for all phases but are extremely important in assessing your current capabilities. When your members require information from process experts, the time needed to receive and explain information is decreased due to a common understanding by everyone involved.

Although understanding the strategic planning process and how to build and maintain a healthy planning team are valuable to planning to plan, obtaining current state performance measurements is undoubtedly the most significant lesson learned, not just by the 89th AW, but by most organizations that perform any strategic planning. Understanding what to measure, when to measure, and how to measure is the cornerstone of planning for your strategic planning.

Works Cited

Goodstein, Leonard, Timothy Nolan, and J. William Pfeiffer, <u>Applied Strategic Planning</u>, Caledonia: McGraw Hill, Inc., 1993, 93-118.

United States. Air Force. The Quality Approach...Your Guide to Quality in Today's Air Force, Maxwell AFB: USAF, Fall 1993, III-1 - III-9.

Strategic Planning and Implementation: Planning To Plan

Lessons Learned From The 89th Airlift Wing

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Abstract

Planning to plan is an invaluable step of strategic planning that helps your team accomplish the planning process in the most efficient and effective manner. How to plan for planning is discussed from theoretical and experiential perspectives using research, experience in business and industry, and a case study of the 89th Airlift Wing's (89 AW) strategic planning experiences. Four main elements are covered in our discussion: 1) The necessary discussions and agreements that facilitate the strategic/performance planning process; 2) The human issues a strategic/performance planning team might face during the different steps of this process; 3) The current performance data that will serve as the basis for your plan; 4) Summary of lessons learned.

We begin with how to form a strategic planning team and move directly to discussions on the strategic planning process and what information is a prerequisite for each process step. The need for team members who represent the organization is presented along side with actual Air Force team descriptions and situations, setting the groundwork for addressing how the needs of individuals can be met while working in a team. The critical nature of obtaining and using performance data is accentuated and the details of the 89 AW's lessons learned are represented throughout the text and in the summary and conclusions.

Introduction

Strategic Planning is the key enabler of quality implementation and effectiveness. Planning to plan is what insures your strategic planning process runs efficiently and your results are successful by first understanding the process and then gathering the necessary information prior to beginning your strategic planning.

It seems that while the need to plan before beginning a large-scale, complex project is usually understood, there is far less understanding of the *need to plan how to plan*. Here, planning to plan means the in-depth consideration of how the planning itself will be conducted-who will be involved, what the timetable will be, what the *un*anticipated consequences of this planning are or could be, what resources are necessary, etc. (Goodstein, Nolan, & Pfeiffer, p.93.)

The Air Force describes the following criterion for planning to plan:

The organizational leaders decide if they're ready to begin the strategic quality planning process. Factors relating to readiness include: the level of commitment, willingness to devote the required time, and the level of trust and teamwork existing within the organization and the senior team. (USAF, III-2.)

Our discussion assumes your organization is ready for strategic planning and your leaders support it. We are now ready to discuss the following aspects of planning to plan:

- 1. The necessary discussions and agreements that facilitate the strategic/performance planning process.
- 2. The human issues a strategic/performance planning team might face during the different steps of this process.
- 3. The current performance data that will serve as the basis for your plan.
- 4. Summary of lessons learned.

Strategic planning requires input from many places and interaction with many people. Understanding the strategic planning process you are intending to use, what types of information you will be feeding into this process, and what individuals will be cycling in and out of your core team are the first considerations.

At the 89 AW, we consider planning to plan the most crucial step of the strategic planning process. We know that if we plan for our strategic planning process we will be successful.

Let's look at what discussions and agreements can get your strategic planning off to a strong start.

Necessary discussions and agreements that facilitate the strategic/performance planning process

The first step in planning to plan is to form your core team. This team will have the responsibility for facilitating and completing the strategic planning process. Who should your core team be? In identifying the most effective planning team, the process should be marketed as a prestigious opportunity to participate in the envisioning of the organization's future and not, as is often the case, a seemingly endless string of meetings that detract from other work assignments without producing any positive impact on how day-to-day decisions are made. (Goodstein, Nolan, & Pfeiffer, 1993.) A group of about 5 to 10 people should provide enough perspective, allow each member time to express their views, and be manageable in terms of process flow. The team should be comprised of both managers and nonmanagers to better represent the organization as a whole. A potential team member's skills and contribution to the process is a good indicator for team member selection.

At the 89th Airlift Wing, we decided to use the quality council as our strategic planning team in order to establish a higher level of buy-in on our final plan. The council is comprised of the wing commander, vice-wing commander, five group commanders (Communications, Medical, Logistics, Operations, and Support), the director of staff, the senior enlisted advisor, and the chief of civilian personnel. This composition allows for all agencies to be represented during the planning process. "Nonmanagers" were consulted during the planning to be sure our organization was fully represented.

With your core team selected, the first task will be to agree on your strategic planning process. The general Air Force process is as follows:

- 1. Planning To Plan
- 2. Values Assessment
- 3. Analyze Mission
- 4. Envision the Future
- 5. Assess Current Capabilities
- 6. Gap Analysis
- 7. Develop Strategic Goals and Objectives
- 8. Develop Functional Plans
- 9. Implement Plans
- 10. Periodic Review
- 11. Annual Review.
- 12. (USAF, Fall 1993.)

Since strategic planning is a substantial endeavor, process agreement allows team members to clarify their understanding of the individual steps. This is the time to review how each planning step contributes to the overall process. This task can avoid frustrating and time consuming diversions from your planning process once it is underway.

At the 89 AW, our first dilemma was our lack of training on a strategic planning process. We were fortunate to have just begun "quality sharing" with Xerox Corporation. With their help, we designed a process with the same basic steps as the Air Force model but with enhancements such as methodologies for each process step.

When our process was approved and we were ready to apply it to our strategic planning, we realized that this would be a major undertaking. We had never performed strategic planning before and decided to tackle this task in three ways: education, training and team building. Our education initiatives are discussed under our strategic goals and objectives development input. Education in the form of publicity, articles, and presentations, became a vehicle for creating understanding and alignment. We held training classes for quality advisors and other individuals who would be directly involved in the strategic planning process. We taught the integration of the Seven Management and Planning Tools (TM Goal QPC) with our strategic planning process. A mini strategic planning session was included on the last day of our training sessions. This course paid off because we had standard terminology, a standard process, and individuals who had an understanding of the strategic planning process. One big benefit of this training came during the current performance analysis and the deployment phases of our strategic planning when we had trained facilitators, as a result of our earlier efforts, who could help our team through these process steps. Our team building efforts are covered in the following section on the human issues planning teams can face.

Another important activity that is helpful in planning to plan is to look at each of the agreed to planning steps and discuss what you will need to begin each step. For example:

Values Assessment - Have you reviewed the Air Force value statements? Do you have explicit Wing or Unit values in addition to the overall Air Force values?

Analyze Mission - Do you have any documentation on what you do? Has what you do changed recently? Do you have documentation on how your functions have changed and why? Do you know of any future orders that may require your function to change in any way? Do you understand who your key customers, requirements, and processes are?

Envision the Future - Do you have a clear visioning process that is understood by all of your team members? Do you have a facilitator to guide you through the visioning process? (Having a team member facilitate this process detracts from his or her participation in the visioning and makes it difficult to be a focused and impartial facilitator.)

Assess Current Capabilities - Do you understand what your critical process are? (Those processes that directly support your vision, goals, and Air Force objectives.) Do you have current data on all of your critical processes? Are the data collected meaningful? Do you know how to obtain the data you need if you don't have it?

Gap Analysis - Do you have a desired state to help you understand your performance gap? Do you have a selection of tools to help you analyze this gap? What can performance gaps tell you? Are you prepared to develop action plans to address these gaps? How will these gaps and action plans be woven into your overall strategic plan? Develop Strategic Goals and Objectives - What information do you need, in addition to your current capabilities and gap analysis, to develop these goals and objectives (and insure vertical alignment)? Do you have a plan, or know how to develop a plan, to create support and commitment form unit personnel?

<u>Develop Functional Plans</u> - Do you have a process in place for communicating your work to functional managers and working groups so they can develop tactical plans necessary to achieve the organization's strategic goals and objectives?

<u>Implement Plans</u> - Do you have a process for tracking implementation?

<u>Periodic Review</u> - Does everyone have a clear understanding of what needs to be measured in this step in order to provide meaningful data?

Annual Review - The Air Force Quality Approach handbook describes this step as an opportunity for the planning team to conduct an annual review of the goals, objectives, and functional plans using system metric data and results of the periodic reviews. The handbook also states that results reviewed should provide feedback for use into the planning cycle. This is planning to plan! Do you have the periodic review results?

Considering inputs, such as the ones mentioned, can prepare your team for upcoming needs and give everyone time to collect necessary information, conveniently, in advance of needing it.

In order for the 89 AW to answer these questions, increase our scope and level of buy-in, and gather more information, we started this phase with our five groups (Communications, Medical, Logistics, Operations, and Support) and the wing staff quality councils. We also decided to use the quality improvement office to facilitate the information gathering process and to provide continuity among the groups and councils.

Our 89 AW strategic planning team held frequent meetings over the course of three months, reviewing each of the planning steps and gathering their inputs. The councils were quite responsive to this task, knowing they would have a say in the strategic direction of the wing. This was the key time to educate the wing quality councils' members on the terminology and procedures we would be using during the strategic planning process.

When the wing quality council finally met to begin strategic planning, the team members understood their direction and were able to accelerate the process. Consensus during the actual strategic planning was high because we had gathered all pertinent information and were well prepared. The inputs the team gathered in the planning to plan stage were as follows:

<u>Values Assessment</u> - The wing quality council was impressed with the 89AW values. <u>Analyze Mission</u>- To be able to analyze the mission and create the mission statement, we gathered the Air Force, AMC, and 21st Air Force mission statements. We also obtained a model for mission statement design from Mr. William A. Ratcliff who, at the time was an advisor to the Air Force Quality Council. The model prepared us to ask the following questions: 1) What is the main service that you provide or the major item you produce; 2) Who do you provide it to (your customer); 3) What value do you add to this product or service.

Envision the Future - We planned on using the Air Force vision statement in conjunction with an exercise that asks us what we want to look like in 5-10 years. Information on, and experience with, the uncertainty of budgets and the rapid changes the military is experiencing were our also inputs into this step.

Assessing Current Capabilities and Gap Analysis - Most of this information was identified during the meeting with the group and wing staff quality councils. Most of the organizations had already identified their critical processes and were able to organize their data for the upcoming process steps. Some, however, had not identified or measured their critical process and, through our planning to plan work, were able to begin this effort in time to collect data to input into these strategic planning steps. We also decided to use the affinity and tree diagrams to help us analyze our future state and compare it with our current state.

<u>Develop Strategic Goals and Objectives</u> - We agreed to use the affinity diagram we planned on creating in the previous step to help us categorize the services we provide so that the affinity labels could outline our goal areas. We also would use the already existing tree diagram as input to create our objectives. We established a plan to communicate and to create alignment through education. We agreed on using presentations, newspaper articles, and training sessions.

<u>Develop Functional Plans</u> - We decided that our deployment plan would be to cascade the strategic plan to the five actual groups and to the wing staff. These groups would then develop their one year tactical (business) plans. These plans would be cascaded down further with the development of tactical plans at the squadron level.

<u>Implement Plans</u> - We decided that quality council members would be assigned to champion and monitor the implementation of objectives.

<u>Periodic Review</u> - We gathered existing monthly metrics and quarterly objectives. Having little performance information to begin with provided an inconsistent picture for our review. This realization in itself was a valuable insight or input into our plans to do strategic planning.

<u>Annual Review</u> - Having no previous plan to incorporate into our planning to plan session required much more work in gathering our inputs for these strategic planning sessions.

The human issues a strategic/performance planning team might face during the different steps of this process

In the course of strategic planning, your core team is enhanced by additional members who bring vital information and varied perspectives on each step of the planning process. This expansion and contraction of your planning team can complicate your process if it is not accounted for and understood from the start.

Some examples might be: when people who perform the work or the processes that support strategic goals join the planning team to brief them on current state performance versus desired state. The ensuing gap analysis may inspire other team members to tell the process experts how they should be doing their job. Maintaining respect for individuals' expertise while questioning thoughtfully is one of many delicate aspects of strategic planning that can be disarmed before it happens by preparation in the planning to plan stage.

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The current performance data that will serve as the basis for your plan

We have already mentioned the need for current state performance measurements. If current performance data are not available, they must be obtained in order to complete your strategic planning. Since data collection is a time consuming process, there is no time like the present to start collecting. If you begin obtaining current state data in advance of your strategic planning, you will have less of a delay waiting for your metrics.

Collecting data is not a casual endeavor; it requires a well thought out and documented plan. It is important to consider what questions you want your data to answer. Some questions your data collection plan should answer are:

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The 89AW had already been collecting data and we felt confident in our metrics. We were trying to measure constant improvement and growth. During this planning phase, however, we began to realize that our metrics were driving our strategic planning. We had been using the data we had historically gathered without revisiting our data collection plan to determine what variables actually needed tracking. When planning to plan, we realized we need to measure our critical, mission-related processes first.

The Directional Gyroscope for a Quality U.S. Air Force: Strategic Quality Principles



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The Directional Gyroscope for a Quality U. S. Air Force: <u>Strategic Quality Principles</u>

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ABSTRACT

Seven out of ten Total Quality (TQ) efforts fail to meet expectations. The U.S. Air Force can avoid these failures. With dedicated application, certain strategic quality principles drive a TQ implementation from the top down and across an organization. They go beyond both operational-level practices such as customer focus and linear steps that attempt to rollout TQ in stages of development. Why not learn from the successes and failures of others? Why not avoid the not invented here syndrome and use best practices? Using strategic quality principles, top leadership establishes TQ policies, provides resources, and avoids micro-management. Boundaries are drawn around parts of an organization based on the ownership of core processes, and then more feasible strategic quality plans are developed by the owners of these core processes. The strategic quality principles which guide planning are: patience; purpose; discovery; ownership; balance; and integration. These principles are based upon years of research and experience. The concentrated use of these can assure the success of a TQ implementation. To many people, however, TQ seems like just common sense. Even though TQ may be easy to understand, it takes tough, dedicated and caring leadership in order to transform an organization to survive and thrive in the chaotic times ahead. Strategic quality principles underpin and guide leadership in the TQ transformation process.

SETTING THE COURSE

Principle Based Planning. Leadership commitment to strategic quality planning is necessary to ensure that modern organizations transform themselves to survive and thrive. The foundation is a set of research and experienced-based strategic quality principles. These principles go beyond operational-level quality principles such as customer focus. Likewise, linear stepwise approaches to TQ are inadequate without these strategic quality principles to guide an organization through the chaos. Briefly, these principles are: patience; purpose; discovery; ownership; balance; and integration.

The Challenge. How do we get strategic quality planning to work in a multi-layered and multi-functional organization like the U.S. Air Force? It is estimated that ninety percent of strategic plans never get implemented. The answer is that strategic quality principles with related research and experience point the way. First, any substantial organizational change, to succeed, is driven from the top. Second, it is essential for the top to clearly define its mission, macro-level core processes, customers, vision, values and guiding principles. Third, the top cascades these things across and down through the whole organization. Fourth, each layer and function of the organization interprets these things and in turn develops their own version of them. By following these steps, a large organization becomes linked and aligned from top to bottom.

The Problem. Some large organizations make the mistake of trying to push a greater level of detail across and down through its layers and functions. Specifically, they attempt to cascade goals and strategies for achieving them completely across and down through the organization. Such a long chain of goals and strategies become too ponderous and collapse from their own weight. This approach is over-kill and over-control. It frustrates people and restricts their imagination and creativity. A better approach is to adopt a strategic business unit (SBU) view. (In the U.S. Air Force, we might instead say either a strategic operational unit or strategic support unit, depending on the assigned role and mission.) These SBUs own macro-level processes that exist to meet external customer requirements. An example of a SBU meeting an external customer's needs would be bombs on a target.

The Solution. In large multi-layered and multi-functional organizations like the U.S. Air Force, there are variable sizes of SBUs located across and down the hierarchy, depending where the boundaries are drawn. For effective goal and strategy setting, each SBU develops, implements, tracks, and adjusts generally through three-levels of internal management. A SBU boundary and three-levels of management can be drawn for any layer or function of a large organization. The three layers are: the executive level (the commander or staff head and his or her immediate subordinates); the management level (the middle managers and staff officers); and the action level (the first-line leaders and workers). Again, to avoid long and ponderous goal and strategy chains, SBU actions are accomplished within its boundaries. This is not to say that one SBU may not task another function or layer outside its boundaries for support. The containment of goals and strategies within SBU boundaries ensure their manageability and also sets an example that guides the rest of the organization.

STRATEGIC QUALITY PRINCIPLES

A simple definition of principles is rules for success. In TQ implementation, it is useful to look at principles from three levels. Higher level principles govern lower-level ones. The three levels are:

- Strategic principles which are overarching guides to action.
- Operational principles which guide production and service activities.
- Tactical principles which guide task level actions.

Again, the following strategic quality principles were derived from research and experience. They are a work in progress that has proven very fruitful.

<u>Patience</u>. This principle is needed to effectively plan and execute. We focus on the long term, but maintain an action orientation and avoid a quick-fix mentality. Like growth and development in a child, we crawl before we walk and walk before we run.

<u>Purpose</u>. The next principle is purpose. Always start with the purpose in mind. In TQ, the purpose is improved mission accomplishment. A clear mission is an essential base to align and stretch an organization toward an ideal future state.

Ownership. This principle means organization-wide engagement in TQ. Everyone knows that owners take better care of property than renters. This principle is realized through stages from awareness of the need for change, then acceptance, involvement, and commitment. Real change starts with leaders who model the needed behavior changes. The objective is to get everyone to act as if they own the organization and the change process.

<u>Discovery</u>. This principle is related to developing a learning organization. People don't like change, but they do like learning and growth. Creativity and risk taking are encouraged and people are allowed to learn from their mistakes. Plans and action need not be perfect. People learn to experiment and take risk within a framework of mission, vision, values and guiding principles. Fear of penalty for honest mistakes and trying new things is eliminated.

<u>Balance and Integration</u>. The combination of balance and integration is the linchpin for the other strategic principles. All aspects of an organization's values and interests are brought into perspective. No one aspect is allowed to suboptimize the whole. Cooperation, harmonization and synchronization are emphasized. The whole organization is linked and aligned from top to bottom in order to realize a synergistic effect where the whole equals more than the sum of its parts.

RESEARCH

Why repeat the mistakes of others? Why not learn from their success and failures. To paraphrase President Clinton, we all possess a wellspring of creativity, but we are loath to learn from others. The tendency toward the not invented here syndrome cuts organizations off from a wealth of knowledge and experience. Highlights of some of the research upon which the strategic quality principles are founded follows:

GAO Study. A General Accounting Office (GAO) study on Quality Management breaks organizational implementation maturity into five phases: (1) Decision; (2) Getting Started; (3) Implementation; (4) Achieving Results; and (5) Institutionalization. This report shows that organizations generally do not reach the fourth phase of achieving significant results until well into their third year. This study reinforces the point that it takes patience to remove barriers, change an organizational culture, and achieve results.

<u>IOS</u>. The International Quality Study (IQS) shows that private sector organizations starting TQ tend to be low performers in terms of profitability (cost-effectiveness in the government), productivity, and customer satisfaction. This study reinforces the point that organizations need to emphasize patience and discovery. It recommends that these organizations use a keep it simple system (KISS), build on basics, focus on process simplification and cycle time reduction, and not try to emulate world-class performers until they are ready for it.

AQP Report. An Association of Quality and Participation (AQP) report on "The Effects of Downsizing on Employee Involvement Activities and Attitudes" shows that downsizing organizations with positive attitudes about employee involvement (EI) realize less negative affects on employee morale than those downsizing organizations with negative attitudes about EI. The lesser negative affect is probably due to employees in general believing that their views and feelings influence downsizing decisions which in turn increases organization-wide cooperation and synergy. This finding is consistent with guidance provided by the ownership, balance and integration principles.

 $\underline{\text{Hard} + \text{Soft}} = \underline{\text{Tough}}$. Research by Dr. Michael Beer shows that a top leadership mandate is a necessary condition for successful change. The top leader makes an unwavering commitment to the transformation process, but encourages everyone's ideas and energy to work out the details. This hard and soft mixture is in effect tough leadership. Toughness is required because change is so difficult to achieve. The tough leader knows that "it is easier for people to act their way into a new way of thinking than it is to think their way into a new way of acting." Change is like driving a car -- we steer it and keep the pedal down to move forward in the right direction. This research illustrates the importance of the patience, balance and integration principles.

OCI. Dr. William Bridges produced an Organizational Character Index (OCI) test based on the Meyers-Briggs Personality Type Indicator (MBTI). The OCI contains the same dimensions as the MBTI for measuring preferences. These dimensions are:

I (Introvert) - E (Extrovert)
S (Sensor) - N (iNtuitor)
T (Thinker) - F (Feeler)
J (Judger) - P (Perceiver)

Organizational health is achieved by appropriately balancing and integrating these dimensions.

<u>The Bureaucratic Organization</u>. Under OCI, the ISTJ organization is the archetypical bureaucratic organization. But just like the MBTI, the OCI is a developmental model where we try to capitalize on strengths and minimize weaknesses. For an ISTJ organization, the following offsets or balances are needed.

- An introverted preference is internally focused. More extroverted customer focus is needed.
- A sensor preference is detail and present time oriented. An intuitor orientation with an appreciation for interrelationships and long-term possibilities are also needed.
- A thinker preference is attuned to logic and rationale for decisions. Feelings, emotions, and values also need to be taken into account.
- A judger preference places value on quick closure in decisions. The perceiver preference values leaving options open and taking the time to consider alternatives.

By using Dr. Bridges' OCI, we can evaluate an organization's strengths and weaknesses to develop more effective strategies. This research reinforces the need for discovery, balance and integration.

<u>Time Management.</u> Dr. Scott Sink divides executive time into three categories. They are A for "administrative time," B for "betterment time," and C for "crisis time." A-time is spent on the routine of daily operations. B-time is spent on improving the organization and making it more productive. C-time is spent on taking care of emergencies. What happens is that C-time invariably pushes out time allocated for B. What it takes to succeed is an unwavering commitment to make time for B. Initially this may require working more hours, but careful scrutiny of how and why crises occur provides useful information. These views reenforce the need for patience, purpose, balance and integration.

IMPLEMENTATION EXPERIENCE

As indicated, the strategic principles of patience, purpose, discovery, ownership, balance and integration are fundamental to success. The prime vehicle for the practice of these principles is the strategic quality plan. This plan establishes the necessary policy, infrastructure, training programs, improvement schedule, and leadership foundation.

<u>TO Umbrella</u>. TQ is best viewed as an umbrella term covering four important aspects. First, it is a management-leadership philosophy emphasizing customer focus, process improvement and teamwork; it is not a program which tends to have a beginning and an end. Second, it uses a strategic planning framework to close the gap between where an organization is and where it wants to be. Third, it provides a methodology to change an organizational culture. Fourth, it includes a set of tools to measure and improve organizational performance.

<u>Three Tracks</u>. Successful TQ implementations are pursued on three tracks simultaneously. First, planning is emphasized to align and leverage an organization for success over the long run. Second, flexibility is practiced in daily management to respond to changes in mission and crises. Third, a limited number of high payoff, cross-functional reengineering projects are carefully selected. This last track is emphasized to sustain the motivation and interest behind TQ and provide immediate returns on TQ training investments.

<u>Infrastructure</u>. Traditional SBUs still tend to organize on functional department lines in silos. To reorient them along horizontal, cross-functional, process-oriented lines, the executives in an SBU form: and executive level Quality Council; a few, as needed, middle management Quality Management Boards (QMB); and underneath the QC or a QMB, as needed, reengineering project teams. These reengineering project teams take on the task of cross-functional process improvement within the SBU.

Replication. For example, it may be considered that the Department of the Air Force macrolevel core processes are to provide resources and personnel, training and logistics, and policy and support to U. S. Air Force Units. The executive leaders of the Department may form a QC to promote and oversee cross-directorate reengineering improvement projects. In turn, middle managers in the various directorates may be assigned to QMBs and their staff officers to reengineering project teams. Likewise, each directorate may treat itself as a SBU and replicate the QC, QMB, and reengineering project team organizational form within its boundaries. This organizational form may be replicated and cascaded across and down throughout the U.S. Air Force in order to realize wide-scale and deep cross-functional reengineering improvements.

Important Work. Conceivably an executive at any level may sit on his or her boss's QC as well as his or her own QC and potentially sit on one or more QMBs or even reengineering project teams. One may say that this sounds like too many teams to sit on, but there is no more important work to be done. This QC, QMB and reengineering project team approach is the only proven method for transforming functionally-oriented organizations to process-oriented organizations in order to build them for the future.

<u>Teams</u>. Again, a team approach is necessary to support cross-functional reengineering projects. The QC at the top supports the QMBs in the middle which in turn support the reengineering teams. A linking-member from the QC sits on each QMB. A QMB linking member in turn sits on each reengineering project team. This linking-member approach is used to communicate and facilitate direction from each level to the next and break down barriers. In addition, successful teams are given clear charter and proper training.

QC Work. The QC's focus is on building the SBU to achieve its purpose. They do this through combination of periodic offsite retreats and scheduled onsite meetings. With the help of a senior consultant, they:

- Update the SBU mission.
- Assess strengths, weaknesses, opportunities and threats.
- Formulate a shared vision.
- Identify macro-level core processes and customers.
- Develop breakthrough goals.
- Prioritize resources.
- Ensure goals are matched with action.
- Seek feedback and adjust at each stage of the organizational building process.

<u>Cascaded Goals</u>. Breakthrough goals are broken down by the QC into targets, strategies to accomplish these target, and success measures. These are cascaded down to QMBs for review, feedback, and action in what is called a "Catch Ball" process. Strategies at the QC level become targets for the QMBs, which in turn break these targets down into more detailed strategies for assignment to reengineering project teams. Again, these strategies become reengineering project team targets which are further broken down into strategies to accomplish targets. This last level is where the true improvement action gets done.

<u>Stay Strategic</u>. The QC stays at a strategic level and focuses on high-level breakthrough goals which are spread by priority over a five-year plan. Discipline is exercised to restrict these goals to the most critical three or four in each year of the plan. This approach is taken to concentrate the energy of the SBU on a few critical goals each year in order to achieve breakthroughs.

TQ Training. TQ training is linked to the strategic quality plan. The best way to do this linkage is to start the training at the top of the SBU and cascade it down. Over the course of a year, the executives spend several days offsite and meet regularly in QC planning, execution and review meetings. Mid managers attend training in quality fundamentals and learn how to serve on mid-level QMBs. Mid managers also develop action plans to implement TQ in their sections. This approach builds understanding, momentum, and the necessary critical mass behind TQ. Sufficient in-house trainers/facilitators are trained to facilitate teams as well as to eventually bring TQ training in-house. Reengineering project teams are trained Just-In-Time (JIT) so they can put their acquired skills right to work. Training degrades over time so this approach is necessary to avoid wasting resources. The workforce is trained only after the strategic quality plan has been completed and disseminated.

<u>Leadership</u>. Leaders ensure that quality improvement efforts receive clear direction, adequate resources, recognition, and celebration. Leaders also ensure that lessons learned are captured and that improvements are standardized and locked in. In addition, leaders are

caring, and they ensure that TQ does not get used for, nor confused with, downsizing and cost reduction. The point is made that TQ actually increases mission capability to cope with necessary cuts. Whenever possible, leaders reassign excess people or make them trainers and facilitators. When these approaches won't work, then leaders cover required reductions either through attrition or outplacement assistance.

<u>The TO Wheel</u>. The TQ Wheel provides a leadership model for understanding and communicating three important segments of the strategic quality plan. The three segments are Daily Management, Breakthrough Goal Planning and Cross-Functional Management. Together they provide a balanced, integrated view of TQ implementation.

<u>Daily Management</u>. This segment is concerned with continuous incremental improvement and standardization of operations within vertically-oriented functional boundaries. Daily Management allows for an indoctrination of employees toward a non-bureaucratic, outwardly-focused, customer-oriented way of doing business, albeit still within their hierarchical-oriented functional boundaries. In effect, Daily Management is done in the functional silos of an organization in lieu of the more difficult boundary-breaking innovations performed by cross-functional reengineering project teams.

Breakthrough Goal Planning. This next segment provides executives with a planning methodology to make breakthroughs on critical goals. Since there are many demands on time and resources, this approach enables a SBU to concentrate on a few vital areas. Using the "catchball" process, it also keeps middle managers and the workforce closely involved. This strategic approach also informs and directs the organization at large in their functional area improvement efforts.

<u>Cross-Functional Management</u>. This segment dovetails nicely with Breakthrough Goal Planning and sets an example for those involved in Daily Management. Since breakthroughs invariably involve more than one functional area, Cross-Functional Management is where carefully selected projects are used to further breakthrough planning goals. These projects are done by reengineering project teams under the oversight of the QC and an assigned QMB. As a SBU progresses on a project-by-project basis in both Daily and Cross-Functional Management and under the direction of Breakthrough Goal Planning, it gradually transforms itself into a non-bureaucratic, customer-driven, high-performance organization.

TQ and Reengineering. One issue that seems to frequently surface is the difference between TQ and reengineering. As indicated earlier, a broad view of TQ is taken and reengineering is subsumed as a powerful process improvement arm of TQ. On the process dimension of TQ, all improvement falls somewhere on a continuum from incremental to radical. Crossfunctional improvement projects tend to fall on the radical or reengineering side of this scale.

<u>User Registration System Process Improvement Project</u>. An example of a low-risk, high-payoff project is a user registration system for a government personnel management organization. This system processes requests from personnel at military installations around the world for access to the various personnel information systems and data bases. Before this system was reengineered, requests were taking an average of 60 days to process, and

customers were unhappy. A reengineering project team was established and identified two problems: One was the sequential nature of the process, and the other was the reluctance on the part of the sub-system managers to grant less restricted access to their data bases. The team made great progress on the sequential problem. First, the team added the capability to accept the requests by FAX. Next, the team converted all requests to electronic data and dispatched them simultaneously to all sub-system managers. These two changes resulted in a reduction in processing and approval of requests to an average of 15 days. The team is now planning further improvements to reduce response time to a few days if not hours.

MAKING TQ HAPPEN

<u>Survival</u>. TQ is a survival issue. Improved performance and customer service are becoming absolutely essential for the U.S. Air Force now and into the future. TQ excites and motivates people; makes their jobs more interesting and meaningful. By involving everyone, we get buy-in and ownership. People are attracted by the opportunity to serve and make a difference. A bureaucratic system thwarts and smothers this motivation. It is the bureaucratic system, not the people, that is responsible for inefficient and ineffective organizations.

<u>Driving Forces</u>. Three major forces are driving the U.S. Air Force more and more toward TQ. First, a push to reduce costs which is forced by large budget deficits and perceived mismanagement. Second, advances in information technology which provide opportunities for improvement that cannot be ignored. Third, global competition which is increasing the public's awareness of comparative values. Consumers are being given more choices, and this realization is now overflowing into the public sector. Quality performance is becoming imperative for anyone who wants to stay in business, public or private. These three forces make a larger move to TQ inevitable.

Keeping the Pressure On. Research shows that TQ implementation successes are not widespread. The precepts of TQ are often described as simple common sense, but as someone once said, "Common sense tends to be awfully uncommon." Most of the prescriptions for TQ implementation center around linear steps such as TQ decision, assessment, and so on, as well as operational-level guiding principles such as adopting a customer focus, involving everyone, and continuous process improvement. What is needed is an overarching strategic approach. The high-level principles of patience, purpose, discovery, ownership, balance and integration provide such an approach. When these principles are practiced to guide TQ implementation, success is assured. Unfortunately, organizations and people tend to be somewhat like rubber bands when it comes to implementing significant change. When the pressure is released for even a moment, they snap back to their original form. However, when the pressure is maintained, the TQ approach to doing business becomes a way of life. Of course, TQ is a continuous journey, and we never really arrive at our destination. By using strategic quality principles to guide TQ implementations at SBU levels, the U.S. Air Force just keeps getting better and better.

BIBLIOGRAPHY

Beer, Michael, Russell A. Eisenstat, and Bert Spector The Critical Path to Corporate Renewal (Harvard Business School Press, Boston, MA, 1990)

Bridges, William. The Character of Organizations: Using Jungian Type in Organizational Development (Consulting Psychological Press, Inc., Palo Alto, CA, 1992)

Buch, Kimberly "The Effects of Downsizing on Employee Involvement Activities and Attitudes" (AQP Research for Practice Series, AQP, Cincinnati, OH, no date)

Clemmer, Jim Firing on All Cylinders (Business One Irwin, Homewood, IL, 1992)

Cocheu, Ted Making Quality Happen (Jossey-Bass Publishers, San Franscisco, CA 1992)

Gore, Al Creating a Government that Works Better and Costs Less (Report of the National Performance Review, U.S. Government Printing Office, Washington, DC, Sep. 7, 1993)

Hammer, Michael and James Champy Reeingeering the Corporation (Harper Business, New York, NY, 1993)

"The International Quality Study: Best Practices, An Analysis of Management Practices that Impact Performance" (American Quality Foundation and Ernest & Young, 1992)

Johnston, Kenneth B. Busting Bureaucracy (Business One Irwin, Homewood, IL, 1993)

King, Bob Hoshin Planning: The Developmental Approach (Goal/QPC, Methuen, MA, 1989)

Mintzberg, Henry The Rise and Fall of Strategic Planning (The Free Press, New York, NY 1994)

"Presidential Award for Quality Self-Assessment Guide" (United States Office of Personnel Management, Federal Quality Institute, Washington, D.C., Fall 1992)

Senge, Peter The Fifth Discipline (Doubleday, New York, NY, 1990)

Sink, D. Scott and Thomas C. Tuttle <u>Planning and Measurement in Your Organization of the Future</u> (Industrial Engineering and Management Press, Norcross, GA, 1989)

Wheatley, Margaret J. <u>Leadership and the New Science</u> (Berrett-Koehler Publisher, San Francisco, CA, 1992)

The HQ AMC/IG QAFA Process – Part II



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The HQ AMC/IG QAFA Process - Part II

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Introduction

During the last 2 years the Headquarters Air Mobility Command Inspector General (HQ AMC/IG) has designed a new process for conducting Quality Air Force Assessments (QAFA). The current QAFA assesses unit leadership, mission performance, and compliance areas using the Quality Air Force (QAF) Criteria.

Purpose

The purpose of QAFAs is to assess and improve the unit's mission capability and performance. This is done by employing two groups of inspectors using the QAF Criteria while performing the following three functions: validating the unit's self-assessment, conducting a Staff Assistance Visit (helping improve the unit), and inspecting compliance areas (special interest items and functions governed by local, state, and federal laws). The command is currently aligning Aircrew Standardization Evaluation Visits (ASEV) conducted by the Numbered Air Forces (NAF) with the QAFA.

Implementation

The methodology described below is the result of almost 2 years of experience in using the Baldrige/QAF Criteria.

Team Composition

The size and composition of the team is tailored for each assessment based on the unit's mission, breadth of functional areas, and specific needs. Unit needs and requirements are determined by the team chief during an advance (ADVON) visit conducted 90 days prior to the QAFA. This was a change from 60 days to give the unit more time to make changes and seek additional information.

An average team was 42 members (including augmentees); however, this number has been reduced down to 30 members based upon better understanding of the QAF Criteria by the unit and reduced training needs of the IG. The average team for a wing consists of: one team chief, an assessment group (AG) with seven members, a functional improvement group (FIG) with 21 members, and 1 administrative assistant. On the average, three observers from outside the IG accompany the team on each assessment. Additional personnel, such as command Quality instructors, can be requested by the unit commander to assist with specific unit issues. One important point to remember is that all IG team members are trained and used for QAFAs.

The team chief, normally a colonel (division or branch chief), conducts the ADVON visit, leads the assessment and improvement groups, conducts IG personal and resource accountability conferences, and participates in the unit's outbrief to the NAF commander and conducts the theater outbrief for the unit.

The AG members are the team's most experienced assessors, familiar in detail with the QAF Criteria and consensus process. These members are responsible for validating the unit's self-assessment report, investigating site visit issues, and identifying strengths and areas for improvement. They also consensus the final score.

The FIG members are fully trained in the QAF Criteria and are functional area experts. Their purpose is to work functional issues at the squadron level; identify crosstell and systemic issues; validate compliance with special interest items (SII) and The Inspector General (TIG) briefs; ensure compliance with federal, state, and local laws; and assist the AGs by gathering additional criteria-related information.

Pre-Visit

Units are notified of upcoming QAFA visits up to 1 year in advance via a "target-month" message and a 6-month "window" letter from the IG. At 120 days prior to the QAFA, a formal letter is sent to units notifying them of specific QAFA dates and requesting the unit to conduct a unit self-assessment (USA) and forward the results to the IG no later than 30 days prior to the visit. At 90 days prior to the team's arrival, the team chief completes an ADVON visit with the unit to explain the QAFA process, detail specific IG requirements, and solicit unit issues and problems beyond unit control, known as systemic issues. This meeting serves to accurately align all customer/supplier needs and requirements to help ensure a productive QAFA visit.

When the IG receives the USA report 30 days in advance from the unit, copies are provided to all team members for visit preparation. The seven category chiefs and FIG preparation is normally completed within 1 week of the visit. The AGs spend approximately 16 hours reviewing the report and identifying strengths and areas for improvement. The FIGs spend approximately 8 hours reviewing the report and looking at their specific areas. During the week prior to departure, QAFA team members attend several meetings: a 1-2 hour consensus meeting by the AGs to score the report (this is for training only), additional Quality/criteria training sessions for all team members and augmentees, an AG-FIG meeting to discuss site visit issues (SVI) and crosstell items, and a predeparture meeting to discuss administrative details. Additionally, individual FIGs are assigned as principal inspectors for each SII, TIG interest item, or command issue.

Visit

The QAFA visit now takes 7 days (down from the previous 9 days) which includes 2 travel days. Upon arrival at the host base, the assessed unit conducts a short inbriefing that includes key personnel introductions, appointment schedules, and local safety procedures. This meeting is followed by a short IG administrative session to review schedules, transportation, and lodging.

During the first 2 days the AGs meet with the unit category points of contact (POC) and other unit personnel to investigate SVIs and collect additional data not identified in the USA. The team philosophy is to gather information about the unit that may have been overlooked in compiling the USA. This is important to note because one of the IG's key customer, the AMC Commander, requires an accurate assessment of the unit's operational readiness and mission capabilities. Until all units have an adequate understanding of the criteria and how it applies, it is incumbent on the IG, in the short term, to aid units' understanding and application of the QAF Criteria.

The primary effort for the FIGs on the first 2 days is gathering and analyzing additional information for the AG developed from the USAs. This requires each FIG to have a thorough knowledge of the criteria and the USA. The information is then provided to the AGs verbally at daily team meetings and in writing on a FIG worksheet. Data is used by the AGs in drafting their reports and for support during the consensus process. On the next 2 days FIGs work to validate SIIs, TIG interest items, compliance areas, identify systemic issues and crosstell, and attend unit Quality team meetings. As this work is completed, FIG emphasis is then placed on improvement efforts at the unit level within their functional areas.

By noon on day 4 the AGs are required to submit initial drafts of their category strengths and areas for improvement. These drafts provide a basis for the afternoon scoring consensus meeting, a 3-4 hour session to discuss site visit findings and to consense the final scores (this is down from the 6-hour consensus). The format for consensing is similar to that taught at the Air Force Quality Institute.

Throughout day 5 the administrative assistants work to complete a final draft of the QAFA report. The report includes an executive summary; the unit's self-assessment with IG-identified strengths, areas for improvement, compliance areas; SIIs; systemic issues; and crosstell. The QAFA scores are now included in the report, at the request of the units, who tracked the scores on their own anyway. During the QAFA visit, units are provided a score profile that provides high, low, and average percentiles for each item and category points for all QAFAs to date.

On day 6 the final workday of the QAFA, the team conducts a final review of the QAFA report, prepares the theater outbrief, and holds an internal IG "hot wash" to improve the QAFA process. The "hot wash" includes an internal IG survey of team members and identifies areas for improvement. Survey data and "hot-wash" minutes are forwarded to the IG's full-time QAFA Working Group for future process improvements. Additionally, the unit is provided a QAFA survey to provide feedback on how well the visit helped the unit improve its performance.

On the last day two briefings will take place. The unit commander delivers the first briefing to the NAF commander. The briefing includes summaries of the unit's self-assessment, significant mission challenges, the impact of Quality on mission capability, higher headquarters issues, the HQ AMC/IG team's performance, and value added to the unit by the QAFA process. Next the IG team chief conducts the theater outbrief which will explain the QAFA results and the score to all unit personnel. This was done at the request of the AMC Commander who was getting feedback from the airmen that they didn't understand the purpose of a QAFA.

Post-Visit

Once the formal visit is completed, IG efforts continue through the crosstell of information and QAFA process improvements. The QAFA report is distributed throughout the command and to appropriate outside organizations to provide feedback, crosstell, and potential benchmarks candidates. Crosstell information identified in the report is added to the AMC electronic bulletin board for wider dissemination. Systemic issues requiring command involvement are assigned a HQ AMC office of primary responsibility (OPR) and responses tracked by the IG. Thirty days after the QAFA, the IG receives the unit survey that provides additional feedback on the value of IG OAFA visits.

Lastly, the IG has established an internal working group to ensure follow-up action is taken on the many QAFA process improvement recommendations. The QAFA Working Group was designed to continuously monitor the QAFA process, take corrective and preventive actions, manage the flow of feedback information, and trend QAFA metrics. The working group is empowered by the process owner to adjust all internal subprocesses to optimize external and internal customer satisfaction.

Lessons Learned - Listen to the Video Tape

While the AMC QAFA process is still relatively new, the IG has observed extremely positive results from the use of this structured, Quality approach to assessing unit performance. The following observations are drawn from our experience conducting 26 QAFAs:

- Success of the Quality approach is highly dependent upon direct leadership involvement.
- The majority of the crosstell and performance improvements come from the active involvement of the airmen and junior non-commissioned officers.
- Long-term, consistent, and continuous effort is the only means to achieve increased performance results.
- USA are an indispensable tool for internal unit improvement efforts and as the primary source of information for the QAFA. Unlike preparing for an old-style inspection, units cannot wait until the last minute to prepare for a QAF Criteria-based assessment.
- The first USA will take a considerable amount of time (approximately 2 months) and effort to get organized and off the ground. Fortunately, the next time around will normally take only half of the time spent the first time.
- The USA is a highly effective leadership tool for improving unit performance and mission capability.

- The QAFA need not only focus on a QAF Criteria assessment, but can also serve as a vehicle for unit improvement efforts, compliance inspections (e.g., safety, environment, contracting), and as a method for identifying crosstell information and systemic problems.
- Greater IG and unit openness has eliminated the old style "adversarial" relationship resulting in enhanced communications, greater cooperation, and teamwork focused on improvement.
- The institution of a QAFA Working Group within the IG to continuously manage, monitor, and improve the QAFA process has significantly enhanced QAFA improvements for the IG.

Results

The AMC/IG has made several improvements to the QAFA which highlight some of the successes using this type of inspection format:

- The AMC/IG is the winner of the St Louis Federal Executive Board Award which annually recognizes area federal agencies for their quality accomplishments.
- The IG has the goal of improving the efficiency and productivity of the QAFA team while at the unit. To reduce costs through our strong training program of both IG members and the units, we have been able to decrease the number of team members from 42 down to 30. Additionally, we have reduced the time involved from 9 days down to 7 days. This has resulted in a savings of nearly 600 temporary duty man-days and in excess of \$15,000 in per diem costs per year.
- In an effort to reduce the frequency of headquarters inspection visits per year to each unit, the command has combined QAFAs and ASEVs to the extent that they are conducted at approximately the same time. The IG has already conducted five QAFAs with this format and will continue to phase in this approach over the next 2 years. Indications show this scheduling method has benefited all involved organizations.
- The IG is leading the effort to increase the crosstell of good ideas and comparative information. An IG customer survey indicated that the number one requirement of AMC units is the need for the improved flow of crosstell information. The IG is distributing all reports on the Scott AFB Electronic Bulletin Board, broken down by subject areas, to make it more meaningful and user friendly. We have seen a strong increase in the use of crosstell information by the units.
- Unit commanders, NAF commanders, and the AMC Commander have repeatedly lauded the value of the new QAFAs. They feel it is more meaningful than the previous-style inspections and places emphasis on mission capabilities where it belongs.

Most of the Quality training for the QAF Criteria has been done in-house or through Air
Force channels, versus contracting the training to professional institutions, resulting in a
savings of approximately \$165,000. Additionally, over 100 augmentees have received a total
of 200 classes of QAF Criteria training, saving their wings the expense of professional
training.

Future Developments

- While the IG is currently conducting new-style QAFAs for all active duty units and has just begun using this format for Air National Guard (ANG)-gained units (four QAFAs completed), our desire is to include Air Force Reserve-gained units in the future. This will be especially beneficial to those wings with Reserve associate units.
- Command leading units are just now beginning to formalize metric programs and to collect comparative information. Based on our observations, significant command improvements to mission capabilities could result from standardized and comprehensive metrics, comparison, and benchmarking programs.
- In order to standardize and baseline QAFA scoring, the IG is developing internal metrics to monitor scores and trends for each unit and individual assessors. Additionally, we are using Air Force Quality Center case studies, the IG USA, and USAs from other organizations to compare and analyze IG scoring practices. The next step will be to standardize IG scoring with the Air Force and other major commands (MAJCOM) by comparing scores from the SECAF Quality Award nomination packages.
- The IG is tracking a possible correlation to the QAFA results with those of our Operational Readiness Inspections (ORI). Early indications have proven favorable; that is a strong QAFA showing will cross over to the unit's ability to do well during an ORI.
- AMC and other MAJCOMs are working with AFIA to help standardize and simplify the effort put into collecting and distributing benchmarking data to the units.

Conclusion

Quality is the result of good leadership. The purpose of the AMC QAFA is to effectively assess the results of leadership and its impact on mission performance and capabilities. To date, the AMC IG has conducted more than 26 QAFAs of active duty and ANG units using the QAF Criteria. From the IG perspective, the criteria provides a very usable, well-structured assessment tool. Unlike the Unit Effectivenss Inspection and Quality Visit days of old, the current QAFA emphasizes results, not just compliance or Quality for their own sake.

The QAF Catalyst



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THE QAF CATALYST

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ABSTRACT

This paper deals with our Quality Air Force culture geared toward the year 2000. How can we stimulate it? What can we do to change turfism into teamwork? Should we forsake an employee's job satisfaction for customer satisfaction? I focus on Trust as the QAF Catalyst, and I discuss how each of us can answer these questions by turning from an I, ME, MINE minded force to a WE, US, OURS minded force. Also, I give five key points on fostering trust between bosses and employees. Lastly, I explain the four trust relationships within any organization.

Push - pull, push - pull. Day in - day out Jack pushed the lever up then pulled it back down. He had done this for the last five years. His co-workers looked to him as the most dedicated among them.

In that time Jack grew dissatisfied with just a steady job, a steady paycheck. "Where do I fit?" He often wondered. And, one day he asked that fateful question out loud. "What's my job? How does it relate to everyone else?" Bewildered and embarrassed, Jack's boss promptly and dutifully scolded such radical behavior, "We don't ask why. We just do! The suits upstairs know what we're doing and that's what counts."

By day's end Jack felt empty and lost, much the way his co-workers left work each day. "Am I needed?" He asked aloud as he drove home in the dark. "Does anyone care?" He had to know. Jack needed to find out where he fit into the big picture. As he pulled into his driveway he had a new conviction. "I'll find out for myself why I'm needed."

That next morning he arrived early for work. The floor looked strange with no one around. It felt lifeless. Jack quietly removed the maintenance panel from the wall next to his lever, his work station. He slowly pushed his flashlight into the hole, peered inside, and received a profound revelation on where he stood as a member of the company.

Behind the wall, the lever he had pushed up and pulled down with a meticulous, steady rhythm for years was attached to - nothing.

Dramatic? Yes. Unrealistic? No. Most of us in today's Air Force still fail to understand how or why our processes relate to our organizations. And, how much more will we know by the year 2000? This led me to ponder the question: How can we stimulate the QAF culture for the next century? I decided to focus on the area of trust. And what better place to begin discussing trust issues than with the chain of command?

In the Air Force (as with all military structures) the chain of command looms vertical. To most, the person at the top seems just that, at the top - psychologically unreachable. With an endless bureaucracy of staff personnel shoving decisions and information every which way but up, teams tend to become isolated from the rest of the Air Force. When this happens we set them up for failure.

The higher up the chain the more defined authority, responsibility and power. Interesting that nowhere in texts on leadership can I find power related to chain of command, though human nature dictates a place for it. The vertical organizational culture breeds the "My job, my power" attitude.

Power. Such a versatile word. Yet the most abused concept in history. What of Rome's glory? Progress. And its downfall? POWER. Babylon? POWER. Someone wanted power over someone else, creating division among organized societies. Nazi Germany? POWER.

The examples above demonstrate the I, ME, MINE syndrome. Today this syndrome has grown into a cultural status quo which can not work within the QAF arena. Any society, riddled with power-lust as the primary objective, has set itself up for defeat.

How can we achieve true process improvement over the next six years? It would be easier if we stop protecting our own turf now to see how other processes relate to our own. Turfism (the I, ME, MINE syndrome) commonly stems from a lack of trust in others. Trust has been with the military since the first army formed to defend their caves.

A few years ago I had the opportunity to discuss my patriotic duty with a World War II vet. He asked me what I did for the Air Force. I got as far as, "My job is..." before the old salty character snapped, " YOU don't have a job. WE have a job. WE defend our country. I asked what you did for the Air Force." He told me that we need to trust each other to do our part. And here lies the key to QAF.

We inject symptoms of the I, Me, Mine syndrome into every process, limiting information the customer gets (keeping control from everyone else). My job, only I can do it right, I know it better than... these things cause divisiveness. As leaders we need to share and listen to ideas openly without retribution. Consistently use the WE, US, OURS language. Soon co-workers and bosses will see the whole squadron, group or wing as a cohesive, interdependent unit within the Air Force. This interdependence becomes the crux of the WE, US, OURS paradigm. Once we change from I, ME, MINE to WE, US, OURS we can have our QAF culture, teamwork. Before the year 2000 we could work to make every situation a win/win.

Unfortunately we face win/lose situations daily. If we satisfy customer needs without over-tasking our employees, we have a win/win situation. Keeping the suppliers happy makes a win/win. Making sure co-workers feel satisfied with their jobs creates win/win in the work center. Then we can look at our processes and say, "We win, our co-workers win, customers win and suppliers win." We must have the win/win attitude consistently to grow successful business relationships.

To accomplish an "all win" situation we need to measure customer feedback. Sometimes adjusting internal standards to changing needs makes satisfied customers out of dissatisfied ones. Through open communication and proper empowerment we help customers and suppliers (and ourselves) achieve a win/win. How do we consistently create a win/win? We give customers what they need. We communicate clearly to our suppliers what our customers need. We communicate to customers what we can do. We empower employees to satisfy customer needs.

A comment arose during the several drafts of this paper that we will not always have a win/win situation. Sometimes a loser must result. This stands true. But, we can lose a few times for a long term win to insure we provide the best product or service possible. In turn, our customers/suppliers will hopefully deliver only their best to us.

The world lives under a leaky roof of misconceptions that most people can not handle empowerment. For decades Japan has proven that when a group directs its own processes they grow consistently more productive than groups receiving constant direction. Still, managers insist on getting on top of that roof alone to patch those holes, to keep control and power. In the end no one, not even leadership, feels happy with the outcome, the process or themselves. When micromanaged we gain no self-satisfaction or pride of ownership. When micro-managing others self-fulfillment comes up lacking.

Interesting that self-satisfaction would become a QAF issue. How many unhappy people usually perform their duties to peak capacity? None. People need a purpose for what they do, and no greater purpose exists than self generated ones.

How can we establish employee satisfaction? First, develop trust purposefully. This means treating each other the way we would want to be treated, honestly and fairly.

Second, listen and act on feelings. Though we need to manage our processes by fact we need to manage people by understanding their needs. People, not data, make our work-force.

Third, reward for conformity to standards without punishing for conflict. Punishment creates low morale, divisiveness and poor productivity with bad quality as the end result. Instead, we need to divert that energy used in conflicts and focus on encouraging conformity to standards. We create trust with a satisfying environment where productivity rises and products reflect quality.

Fourth, show sincere appreciation not canned gratitude. Showing sincerity tells the employee, "I'm worth something on the job. I'm needed here." Canned gratitude appears forced and stifles positive feedback.

Fifth, public recognition goes only so far, private recognition lasts forever. This shows sincere appreciation. Private recognition may give enough incentive to try harder at achieving quality workmanship. End result? Pride in a job well done, self-satisfaction.

More than money, more than awards people respond to valid, honest appreciation for accomplishments given from the heart. Ignore it once and we may never see that kind of commitment again. Once violated, trust grows hard to recoup. I developed a model to show the four trust relationships and how they affect the flow of communication and productivity which both affect customer satisfaction.

The relationships rest between leaders and followers, or boss and employee. In the box titles the leadership or boss comes first, then the employees, i.e. "TRUST/MISTRUST" Boss = TRUST, Employees = MISTRUST.

TRUST MODEL

Box: 1 TRUST/TRUST	TRUST/MISTRUST
Open Communication	Limited Communication
We, Us, Ours	Boss Open To Change
All Forces Working Together	Employees In I, Me, Mine (Poor Morale)
Synergistic Teamwork	Boss Not Included In Team, Employee Choice
Continuous Improvement Active	Whether Or Not Boss Participated, All Teams Are Dysfunctional
High Levels Of Performance	
Box: 3 MISTRUST/TRUST	Box: 4 MISTRUST/MISTRUST
Limited Communication (Authoritarian)	No Communication
Employees Open To Change	All Forces In Opposition
Boss In I, Me, Mine (Poor Leadership)	Non-functional Teams, No Efforts To Improve
If Boss Participates In Teams, They Become Ineffective	Low Performance Levels

Rodger Adair, 1993

EXPLANATIONS

- 1. TRUST/TRUST: Obviously synergy has grown from the leadership/employee relationship. Both feel happy with the arrangement. Continuous improvement can move forward unhindered.
- 2. TRUST/MISTRUST: Most common after a recent change of command or change of heart from the old boss. Leadership sees a problem and wants to correct it. If they focus on morale, empowerment and recognition (in its various forms) they can move their organizations to box 1. If leaders falter or fail to follow through, procrastinating continuous improvement efforts, the organization will easily dock their units in box 4. Leaders must remain committed and consistent even when it gets tough to do so.
- 3. MISTRUST/TRUST: When employees feel ready for empowerment, change, improvement and/or better conditions they get squelched by micro-managers and poor leaders who keep accountability away from the lowest levels. This quickly leads an organization to box 4. If people persevere, focusing on the process and not leadership faults, they can lead the organization to box 1.
- 4. MISTRUST/MISTRUST: The one place no one wants to work, yet most of the Air Force seems to gravitate toward. Here sits an atmosphere non-conducive to Quality, continuous improvement or even slight interest in the overall process. People stay here because they think they have no choice. They want to just get a paycheck, to make ends meet, not to produce the best they can. No one grows here.

Looking at the chart we see that of the four trust relationships only one produces positive results. Thus, trust becomes the catalyst in all relationships; the root cause of mature and dynamic organizations who succeed where others fall short.

To establish a sense that employees can trust management we must first trust employees. Doing this consistently would be like everyone in that unit getting up on that leaky roof and repairing it together. Here rests the seedling of teamwork.

Trust generates morale while teamwork produces positive output. Morale affects customer satisfaction which affects productivity which affects trust... What a cycle! The infamous French General of the 19th century, Napoleon Bonaparte, once said, "Morale is a factor of four to one over food on the battle field." This puts organizational behavior in a new light.

In organizations with high positive morale commanders never exert control without first seeking permission from subordinates. Could respect be that important to us all?

Relating this to a more personal level, my four year old daughter loves her toys as much as she loves mommy, daddy and baby brother, a bit more than her kitty Ralph (name chosen by consensus) and a lot more than her big sister.

Chelsi will share her toys easily with Colin, our sixteen month old rather than Melissa, our eight year old. At first glance most people would assume Melissa and Chelsi have more in common, and they do. So why would Chelsi waste her time sharing with her baby brother while going out of her way to not share with her big sister?

Simple answer. Colin can not exert control over Chelsi's toys. She lets him play with anything he likes and she still owns each prized possession. She trusts him. On the other hand, Melissa controls their activities deciding which dolls go where. She becomes the boss. She says, "Chelsi's too little to play right." Obviously threatened, Chelsi chooses to associate where she feels free to play with her own toys without contention.

This same psychology can be applied to the Advance. How can someone excel with a process they're not empowered to improve? Job interdependence equals flee, unthreatened association among co-workers, shops, offices, customers and suppliers.

True, we volunteered for the military not day care. Think in terms of combat. No one can fight a war alone. At that time, under enemy fire, men and women grow more interdependent than any other time. Why do we have to wait for war to act as necessary parts of the same team?

Even after several drafts of this paper I kept taking the view that teams develop organizational oneness, synergy. The more I researched the subject the more I had convinced myself that, while teams may be integral to process improvement. They stand as only part of what we need to keep the organization on line and pointed toward Steven Covey's True North, toward QUALITY.

Now, imagine the engine in a car with hundreds of odd shaped rods, shafts, pieces of rubber and cork, a heavy liquid to lubricate it. It has support systems such as the battery and radiator. With proper care, this engine should run smoothly for a long time. Every part seems useless on its own, but inside an engine each part runs in sync one to another -

synergy. Unlike an engine, teams aren't mechanical. Teams need leadership to develop and maintain synergy in the workplace.

I believe that organizations culminate from a group of convoluted dreams and goals aligned toward one common direction. Though we start from many different points, we can all arrive at the same destination. When even one dream or goal falls out of sync with the rest of the organization something needs to guide us back. Repair the process, replace the part and keep our engine running smoothly. How do we do this? Trust each other and live worthy of trust!

So, I ask again: How can we stimulate the QAF culture for the next century? Which direction is our North, and by the year 2000 will it be True?

BIBLIOGRAPHY

- Approaches To Human Communication, 1972
 Richard W. Budd and Brent G. Ruben
- 2. Theories Of Organization (selected readings), 1975 Edited by: Henry L. Tosi
- Etzioni's Theory Of Organizational Compliance R. J. House
- The Management Of Innovation
 T. Burns and G. M. Stalker
- "Interactive" Organization Theory Alan Filley and Robert House
- 3. Designing Effective Work Groups, 1986
 Paul S. Goodman
- 4. The Fifth Discipline, 1990 Peter M. Senge
- Personal Leadership Application Workbook, 1993
 Steven R. Covey
- 6. Spiritual Roots To Human Relations, 1970 Steven R. Covey
- 7. Proceedings, Quest For Quality, 1993 Air Force Quality Institute
- Creative Leadership For Total Quality
 Dr. Richard Lester
- Is QAF Destined For Failure?
 Captain Kenneth Theriot
- World Class Customer Service
 Roderick M. McNealy

The Third Deadly Disease: The Costs of Rewarding Individual Performance



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THE THIRD DEADLY DISEASE: THE COSTS OF REWARDING INDIVIDUAL PERFORMANCE

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Abstract

Much psychological research calls into question the common practice of rewarding individual performance. This research indicates that performance rewards produce three costs that together outweigh whatever the benefits might be. First, rewards destroy teamwork by embittering the unrewarded and by fostering rivalry. These effects are seen in studies of the perceived fairness of promotion and pay decisions and in investigations of social dilemmas. Second, rewards diminish workers' intrinsic motivation by conveying to them a sense that they are being manipulated. This conclusion follows from extensive investigation into the so-called "overjustification effect" of external reward on intrinsic motivation. Third, rewards increase worker's resistance to the organization's goals because people perceive the attempted manipulation as a threat to their autonomy. In light of these three costs, current performance recognition programs should be abandoned. In their place, recognition programs need to be developed in which the rewards are perceived as fair, available to everyone, and natural consequences of performance. Implications for individual promotions and for team versus individual recognition are discussed.

Introduction

Nearly everyone agrees that exceptional individual performance ought to be rewarded. W. Edwards Deming (1986, p. 117), who has labeled performance evaluation as the third of seven deadly diseases, has nevertheless said that we should recognize outstanding performance in some way. The Air Force's publication, *The Quality Approach*, is even more explicit:

Using a reward and recognition program continually reinforces Quality Air Force concepts and philosophies. Existing reward programs need to emphasize the contribution an individual has made to the overall organizational efforts. [United States Air Force, 1993, p. V-5]

Nevertheless, much research in psychology indicates that rewarding individual performance can be counterproductive, resulting in costs that could outweigh the benefits. These costs include less teamwork, less intrinsic motivation for those who are rewarded, and more resistance to organizational goals.

In this paper I review the psychological literature documenting these costs of performance rewards. Afterwards, I identify characteristics that rewards should possess in

order to avoid these costs. Finally, I discuss what kinds of rewards might have these desirable characteristics.

Less Teamwork: Embitterment and Rivalry

Deming (1986) argued that rewarding top performers has two principal effects that both serve to destroy teamwork. First, it frustrates and embitters those who are not rewarded. Second, it creates rivalry, the antithesis of teamwork.

Deming (1986) shows that there is rarely any logical basis for rewarding some people but not others based on their objective performance. To reward on the basis of performance, he maintains, assumes that people are entirely responsible for their respective performances. Yet some workers do better than others for reasons that have nothing at all to do with individual ability or effort. Deming (pp. 109-115) reports results from his famous red bead experiment showing that large differences in worker performance can result from normal variability in what appears to be a stable system. The workers are not responsible for this variability -- it is caused by the system. As a result, Deming says that we cannot rule out the possibility -- indeed the likelihood -- that the lowest performer is just as worthy of reward as the highest. But when the top performer receives special recognition, the low performers realize that they were just as competent and just as hard working. The result is devastation and bitterness for the unrewarded, which in turn leads to demotivation and even poorer performance in the future.

Psychological studies of the effects of performance rewards on the unrewarded strongly support Deming's conclusion. As Deming predicts, workers passed over for pay increases or promotion typically feel that they have been unfairly treated (Ambrose, Harland, and Kulik, 1991; Schwarzwald, Koslowsky, and Shalit, 1992). In addition, Schwarzwald and his colleagues found that workers expressed less commitment to their employers and were absent from work more often after being passed over for promotion. Workers' perceptions of injustice are of particular concern because studies have shown that workers who feel unfairly treated are less likely to enjoy their jobs (Witt and Nye, 1992), to be "good citizens" of the organization (Moorman, 1991), or to perform their jobs well (Harder, 1991).

Embittered, demotivated workers obviously make poor team members. But Deming argues that the mere promise of competitive reward disrupts teamwork. Such a promise creates rivalry among co-workers thereby preventing them from working cooperatively toward common goals. Like Deming's first conclusion, this one also finds support in the psychological literature, especially in studies of social dilemmas.

A social dilemma is a situation wherein the individual's self-interest is at odds with the group's. For example, at the Air Command and Staff College, the largest number of students in a seminar benefit if everyone studies together, sharing notes and insights. Students with mission support backgrounds benefit from the insights of those having operational experience -- and vice versa. Likewise, those who may not have understood a particular reading benefit from those who did. Yet ACSC in past years also had a distinguished graduate program intended to recognize those students who performed remarkably better than their peers. Rightly or wrongly, many students believed that being

a distinguished graduate would enhance their prospects for promotion as well as for various career opportunities. Therefore, it seemed to be in each student's interest to do the best he or she could while doing nothing that would help others to compete. Therein lay the dilemma: students could enhance their chances of becoming a distinguished graduate only if they deprived the group of its best chance to learn.

Robyn Dawes (1980) reports the results of several experiments investigating how people behave in such social dilemmas. In one experiment, for example, each of three subjects could hold up either a red or a blue chip. If a subject held up a red chip, she received \$2.00 and the other two were fined \$1.00. If she held up a blue chip, she received a dollar and the others were fined nothing. Therefore, if everyone held up a blue chip, everyone made a dollar. But if everyone held up a red chip, no one made anything. Dawes observed that, despite its obvious disadvantage, the most common response in this experiment was to hold up a red chip. Along with several other experiments that Dawes presents, this result shows that, when faced with a choice between what seems to be good for themselves versus what is best for the group, most people resolve the dilemma in favor of themselves. Thus, the ACSC student who wanted to be a distinguished graduate was unlikely to cooperate with his seminar mates because doing so could only make them stronger competitors. The same can be said of any other team situation in which individuals nevertheless compete for rewards.

Less Intrinsic Motivation

Besides causing embitterment and less teamwork, rewarding individual performance also undercuts the intrinsic motivation of those rewarded. Intuitively, intrinsic motivation refers to the degree to which people do their jobs for personal satisfaction. Operationally, it refers to the time or effort that people devote to a task in the absence of any external incentive. Quality organizations depend on intrinsically motivated workers; these are the workers who, as team members, show initiative and work hard without concern for who will get the credit. Therefore, anything that subverts intrinsic motivation lessens teamwork and hurts an organization's chances for success.

Prior to 1971, social psychologists had only speculated that external rewards might lessen intrinsic motivation. Deci (1971) was the first to produce an empirical demonstration of this counterproductive effect. He paid some college students to solve puzzles; others solved the same puzzles without being paid. Later, the students had an opportunity to play with more puzzles or else to engage in other activities while waiting alone, believing themselves to be unobserved. Deci reported that those who had been paid were less likely to play with the puzzles than those who had not been paid. Since then, studies demonstrating this peculiar effect have proliferated Lepper and Greene (1975), Lepper, Greene, and Nisbett (1973), Lepper and others (1982), Pretty and Seligman (1984), Pritchard, Campbell and Campbell (1977), Ross (1975), Ryan, Mims and Koestner (1983), and Thompson, Chaiken, and Hazlewood (1993).

An important question raised by these studies concerns what causes external reward to destroy intrinsic motivation. An early explanation, derived from Bem's (1972) controversial self-perception theory, was that people infer their motives from the nature of

the situations in which their behaviors occur. If people see themselves performing a task in the absence of any obvious external reason for doing so, they conclude that they enjoy the task. But if they see themselves performing the same task for an external reward, they conclude that it is the reward that motivates them. When the reward is withdrawn, they can see no external reason to continue the task and therefore stop. In a sense, then, the reward "over-justifies" the behavior, leading psychologists to call this undercutting of intrinsic motivation the "overjustification effect."

More recent research has cast serious doubt on the self-perception account. Boggiano and Ruble (1979) and Rosenfield, Folger and Adelman (1980) both reported that the overjustification effect failed to occur when people saw the extrinsic reward as resulting from their own skill. Pretty and Seligman (1984) showed that the effect occurred only when people thought that they were being bribed.

Richard Ryan (1982) seems to have provided the most integrative explanation for the overjustification effect. As in other studies, Ryan had subjects solve several puzzles. In one condition, he gave the subjects verbal evaluations as they worked on a puzzle. For example, if they were doing well, he would say, "Excellent. You should keep up the good work." If they were having difficulty, he would say, "Poor. You should do better." In a "non-evaluative" condition, he gave subjects feedback suggesting that they were performing successfully but without any explicit qualitative assessment. Ryan obtained the normal overjustification effect -- but only with subjects who were given the evaluative feedback. He also observed that, compared to other subjects, those given evaluative feedback exerted less effort in trying to solve the puzzles.

Ryan explains these results in terms of subjects' perception of their personal autonomy, an interpretation recently supported by Thompson, Chaiken, and Hazlewood (1993; see also O'Reilly, 1991). From the subjects' viewpoint, the evaluative feedback represented the experimenter's attempt to control their behavior. People, however, want to control their own behavior; they do not want someone else trying to control them (Averill, 1973; Kelley,1971; Liu and Steele, 1986; Pittman and Pittman, 1980; Solomon, Holmes, and McCaul, 1980). Therefore, subjects responded by rebelling in the only way possible short of walking out of the experiment: they exerted less effort and rejected the puzzles as a source of entertainment. In this way, Ryan reasoned, subjects asserted their own will over that of the experimenter.*

The role that perceived loss of control plays in the overjustification effect suggests that programs to reward individual performance are likely to undercut intrinsic motivation only if they are perceived as attempts to influence workers' behaviors. Not all reward programs have this intent, of course. Most people understand, for example, that military promotions serve the legitimate purpose of selecting future leaders. In these cases, the crucial issue may be whether the selection procedures are perceived as being fair (Moorman, 1991; O'Reilly, 1991). Unfortunately, as Ambrose, Harland, and Kulik (1991) have pointed out, most performance recognition programs *are* intended to influence worker behavior. We can hardly expect workers not to realize this fact.

^{*}Eisenberger and Selbst (1994) suggest that this kind of rebellion arises not from the rewards themselves but from the perception that the rewards are withheld unfairly (p. 1125).

More Resistance to Organizational Goals

The previous discussion establishes a close relationship between the overjustification effect and psychological reactance (cf., Ryan, 1982), the latter described by Brehm (1966) as a motivation to restore personal freedom. This relationship between the two constructs suggests that performance recognition programs should have a broad range of psychological effects in addition to undermining intrinsic motivation. The net result of these effects is that workers will find safe ways to resist the organization's goals.

Studies of reactance usually fall into either of two categories, one examining the effect of restricting people's choices, the other focusing on attempts at persuasion. Choice restriction studies usually proceed in three stages. In the first stage, subjects rank various alternative choices in order of preference. In the second stage, the subjects' ability to select one of the alternatives is eliminated. In the third stage, subjects rank their preferences for all of the alternatives a second time. Cherulnik and Citrin (1974) and Rhodewalt and Davison (1983) both demonstrated that eliminating an alternative increases its attractiveness. Hammock and Brehm (1966) varied this procedure slightly. Instead of simply eliminating an alternative, they eliminated choice altogether, forcing subjects to accept one of the alternatives. In this circumstance, the attractiveness of the forced alternative declined precipitously. Besides enhancing the attractiveness of choices denied them, reactance also leads people to reject choices that are forced on them.

In performance reward programs, of course, alternative behaviors are not explicitly denied or forced. They are simply encouraged or discouraged. The promise of reward is therefore a form of persuasion rather than explicit coercion. Nevertheless, several experiments have shown that reactance occurs in response to even subtle efforts at persuasion. Brehm and Sensenig (1966) showed that attempting to influence high school students to choose one of two pictures caused them to pick the opposite. Austin (1989) demonstrated that telling workers what goals they should attain produced less goal commitment than allowing them to set their own goals. Worchel and Brehm (1970) showed that telling people that they should think as they already thought caused them to change their minds!

These results are important to the issue of performance recognition programs in quality organizations. Recall the quote from *The Quality Approach*: "Using a reward and recognition program continually reinforces Quality Air Force concepts and philosophies" (p. V-5). The implicit message is a clear imperative: in order to receive rewards and recognition, one must accept Quality Air Force concepts and philosophies. Based on studies of reactance, we can expect this message to be counterproductive; it may well cause people to resist rather than accept quality concepts.

Conclusion

Deming (1986) condemned performance evaluation as one of the seven deadly diseases. As we have seen, the psychological literature strongly supports him on that score. Performance rewards and recognition programs embitter unrewarded workers, create rivalry that destroys teamwork, lessen workers' intrinsic motivation, and engender resistance to the organizations' goals. The primary reasons for these counterproductive

and -- to many leaders -- surprising effects are that rewards are usually competitive, based on variations in performance for which people are not themselves responsible, and perceived as attempts to manipulate people's behavior, thereby usurping their autonomy. This last point is particularly ironic: it implies a basic contradiction between the use of reward programs and the quality philosophy of worker empowerment.

Yet the use of performance awards is widespread throughout both the military and industry. Most Air Force organizations have competitive awards for the outstanding airman, NCO, company grade officer, and civilian of the quarter. In addition to these awards, an organization for which I once worked had a scientist of the year program. Professional military education schools have distinguished graduate programs as well as a host of other rewards bestowed on a handful of apparently exceptional students. Should the Air Force eliminate these programs? The answer seems to be "yes."

This does not mean that there should be no performance recognition of any kind. It does mean that, in order to avoid the costs identified in this paper, performance awards should have at least three characteristics.

First, individual performance rewards should recognize only those whose performance demonstrably lies above the range of systemic variability. Statistical process control methods alone can identify such individuals. If everyone within the range of systemic variability recognizes that a rewarded individual is truly exceptional, then they will likely regard the reward as fair and not feel embittered (Moorman, 1991; Witt and Nye, 1992). But if statistical process control methods cannot reasonably be applied, then there is no objectively justifiable basis for individual reward. Bitterness is likely to follow.

Second, rewards should be available to everyone who deserves them. Rivalry results when desirable rewards are scarce. Distinguished graduate recognition, for example, produces competition because only a limited number of students are permitted to receive this award. If rewards are not to destroy teamwork, they must be given to everyone who deserves them, even if that is everyone.

Third, rewards should be the *natural* consequences of doing well. They should not appear to be tools for controlling people's behavior. In industry, profit-sharing plans meet this requirement: profits go up when workers are efficient and customers are happy with the workers' product. Rewards that are perceived as natural consequences should not diminish intrinsic motivation, nor should they produce resistance to the organizations' goals.

What kinds of rewards possess these three characteristics? It is clear that the first and second characteristics contradict each other. The same rewards given to the truly exceptional performer cannot simultaneously be available to everyone. This observation suggests two non-overlapping classes of rewards: those that are naturally scarce and unsharable, and those that exist in abundance or are at least can be shared. Leadership positions are scarce and unsharable. There can be only one president, only one department head, only one commander. Arguably, leadership positions are also natural consequences of exceptional performance. At any rate, exceptional performance seems to be a reasonable prerequisite for leadership. Therefore, promotion to a leadership position seems an appropriate reward for the truly exceptional performer. Other rewards for

exceptional performers may also be appropriate provided that they are natural consequences, naturally scarce and naturally unsharable.

Profits, even when scarce, are sharable and therefore provide a model for natural rewards in the second category. When a profit-sharing company does well, everyone directly and tangibly benefits. A similar situation occurs when teams rather than individuals are rewarded: that is, everyone on the team shares the rewards equally. A legitimate concern in these situations is that some individuals will do all the work while others do little or nothing. This "free-rider" phenomenon, called *social loafing*, is unfortunately well-documented in team settings (Geen, 1991). Collectivistic cultures such as China's and Japan's effectively prevent social loafing: group members monitor each other's performance and apply severe social sanctions to free riders (Baron and Byrne, 1991, p. 456; Yamagishi, 1984; see also Bond, Leung, and Wan, 1982, and Leung and Bond, 1984).). This observation indicates the importance of personal accountability, consistent with Geen's (1991) conclusion that social loafing ceases to be a problem when each individual's contribution is clearly identifiable.

Besides profits, what kinds of rewards are sharable, natural consequences of team performance? This question is critical because profits are not usually (if ever) meaningful in government service organizations. To develop an answer, consider that service organizations have beneficiaries, analogous to the customers of private businesses. In private business, profits ultimately derive from satisfied customers. It therefore seems reasonable that whatever rewards or recognitions are shared by team members should be directly tied to the degree beneficiaries are satisfied with the provided service. This restriction immediately removes from consideration team rewards based on artificial criteria that matter to no one but management.

The following example helps illustrate the principle. Dollars saved in a Veterans Administration medical laboratory may be important to hospital managers but probably mean little to doctors and patients. Therefore, rewarding laboratory teams based on cost savings is really management trying to control behavior, albeit to a good end. Realizing that they are being controlled, laboratory personnel will probably respond with less intrinsic motivation and more resistance. That they might agree with the ends probably doesn't matter, as Worchel and Brehm's (1970) data suggest. Rather, teams should be rewarded based on how satisfied doctors and patients are with the timeliness and accuracy of laboratory reports. Further, recognition should arise from the doctors and patients themselves, to the degree that this is possible. These are the beneficiaries of the laboratory's service and therefore the source of natural rewards. Physicians as well as patients should have the opportunity to thank laboratory personnel. If teams are to be rewarded with monetary benefits such as bonuses or paid time off, these should be presented by representatives of those whom the teams serve: the patients and their doctors.

As this example illustrates, devising rewards that meet the criteria of being fair, available to everyone, and natural may take some thought. It will almost certainly be more difficult than the old way of simply dispensing quarterly rewards to people based on what may have been vague and unfair criteria. That old way, as we have seen, most likely didn't work and probably made things worse. If we are to have rewards, then, we should

take this new approach. If this approach is too hard, we will be better off without rewards.

REFERENCES

- Ambrose, M. L., Harland, L. K., and Kulik, C. T. (1991). Influence of social comparisons on perceptions of organizational fairness. *Journal of Applied Psychology*, 76, 239-246.
- Austin, J. T. (1989). Effects of shifts in goal origin on goal acceptance. Organizational Behavior and Human Decision Processes, 44, 415-435.
- Averill, J. R. (1973). Personal control over aversive stimuli and its relationship to stress. *Psychological Bulletin*, 80, 286-303.
- Baron, R. A., and Byrne, D. (1991). Social psychology: Understanding human interaction. Boston: Allyn and Bacon.
- Boggiano, A. K., and Ruble, D. N. (1979). Competence and the overjustification effect: A developmental study. *Journal of Personality and Social Psychology*, 37, 1462-1468.
- Bond, M. H., Leung, K., and Wan, K. C. (1982). How does cultural collectivism operate? The impact of task and maintenance contributions on reward distribution. *Journal of Cross-Cultural Psychology*, 13, 186-200.
- Brehm, J. W. (1966). A theory of psychological reactance. New York: Academic Press.
- Cherulnik, P. D., and Citrin, M. M. (1974). Individual difference in psychological reactance: The interaction between locus of control and mode of elimination of freedom. *Journal of Personality and Social Psychology*, 29, 398-404.
- Dawes, R. M. (1980). Social dilemmas. Annual Review of Psychology, 31, 169-193.
- Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. Journal of Personality and Social Psychology, 18, 105-115.
- Deming, W. E. (1986). Out of the Crisis. Cambridge, MA: Massachusetts Institute of Technology Center for Advanced Engineering Study.
- Eisenberger, R., and Selbst, M. (1994). Does reward increase or decrease creativity? Journal of Personality and Social Psychology, 66, 1116-1127.
- Geen, R. G. (1991). Social motivation. Annual Review of Psychology, 42, 377-399.
- Harder, J. W. (1991). Equity theory versus expectancy theory: The case of major league baseball free agents. *Journal of Applied Psychology*, 76, 458-464.
- Kelley, H. H. (1971). Attribution theory in social interaction. In E. E. Jones, D. E. Kanouse, H. H. Kelley, R. E. Nisbett, S. Valicks, and B. Weiner (Eds.), *Attribution: Perceiving the causes of behavior* (pp. 1-26). New York: General Learning Press.
- Lepper, M. R., and Greene, D. (1975). Turning play into work: Effects of adult surveillance and extrinsic rewards on children's intrinsic motivation. *Journal of Personality and Social Psychology*, 31, 479-486.
- Lepper, M. R., Greene, D., and Nisbett, R. E. (1973). Undermining children's intrinsic interest with extrinsic reward: A test of the "overjustification" hypothesis. *Journal of Personality and Social Psychology*, 28, 129-137.

- Lepper, M. R., Sagotsky, G., Dafoe, J. L., and Greene, D. (1982). Consequences of superfluous social constraints: Effects on young children's social inferences and subsequent intrinsic interest. *Journal of Personality and Social Psychology*, 42, 51-65.
- Leung, K., and Bond, M. H. (1984). The impact of cultural collectivism on reward. Journal of Personality and Social Psychology, 47, 793-804.
- Liu, J. L., and Steele, C. M. (1986). Attributional analysis as a self-affirmation. *Journal of Personality and Social Psychology*, 51, 531-540.
- Moorman, R. H. (1991). Relationship between organizational justice and organizational citizenship behaviors: Do fairness perceptions influence employee citizenship? *Journal of Applied Psychology*, 76, 845-855.
- O'Reilly, C. A. III. (1991). Organizational behavior: Where we've been, where we're going. *Annual Review of Psychology*, 42, 427-458.
- Pittman, T. S., and Pittman, N. L. (1980). Deprivation of control and the attribution process. *Journal of Personality and Social Psychology*, 39, 377-389.
- Pretty, G. H., and Seligman, C. (1984). Affect and the overjustification effect. *Journal of Personality and Social Psychology*, 46, 1241-1253.
- Pritchard, R. D., Campbell, K. M., and Campbell, D. J. (1977). Effects of extrinsic rewards on intrinsic motivation. *Journal of Applied Psychology*, 62, 9-15.
- Rhodewalt, F., and Davison, Jr., J. (1983). Reactance and the coronary-prone behavior pattern: The role of self-attribution in responses to reduced behavioral freedom. *Journal of Personality and Social Psychology*, 44, 220-228.
- Rosenfield, D., Folger, R., and Adelman, H. F. (1980). When rewards reflect competence: A qualification of the overjustification effect. *Journal of Personality and Social Psychology*, 39, 368-376.
- Ross, M. (1975). Salience of reward and intrinsic motivation. *Journal of Personality and Social Psychology*, 43, 245-254.
- Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 32, 450-461.
- Ryan, R. M., Mims, V., and Koestner, R. (1983). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 45, 736-750.
- Schwarzwald, J., Koslowsky, M., and Shalit, B. (1992). A field study of employee's attitudes and behaviors after promotion decisions. *Journal of Applied Psychology*, 77, 511-514.
- Solomon, S., Holmes, D. S., and McCaul, K. D. (1980). Behavioral control over aversive events: Does control that requires effort reduce anxiety and physiological arousal? *Journal of Personality and Social Psychology*, 39, 729-736.
- Thompson, E. P., Chaiken, S., and Hazlewood, J. D. (1993). Need for cognition and desire for control as moderators of extrinsic reward effects: A person x situation approach to the study of intrinsic motivation. *Journal of Personality and Social Psychology*, 64, 987-999.
- Thompson, S. C. (1981). Will it hurt less if I can control it? A complex answer to a simple question. *Psychological Bulletin*, 90, 89-101.

- United States Air Force. (1993). *The Quality Approach*. Maxwell AFB, AL: Air Force Quality Institute.
- Witt, L. A., and Nye, L. G. (1992). Gender and the relationship between fairness of pay or promotion and job satisfaction. *Journal of Applied Psychology*, 77, 910-917.
- Worchel, S., and Brehm, J. W. (1970). Effect of threats to attitudinal freedom as a function of agreement with the communicator. *Journal of Personality and Social Psychology*, 14, 18-22.
- Yamagishi, T. (1988). Exit from the group as an individualistic solution to the free rider problem in the United States and Japan. *Journal of Experimental Social Psychology*, 24, 530-542.

Total Quality Leadership in the Fleet: From Theory to Practice



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Total Quality Leadership in the Fleet: From Theory to Practice

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Abstract

Elements of the Department of the Navy Total Quality Leadership (TQL) approach have been successfully applied in most types of Navy work settings--headquarters, industrial activities, and shore commands. Left unanswered was the question of how TQL would be applied in an operational setting. Would the requirements of operational units differ from those of shore-based organizations?

The presenter describes the early experiences of operational units selected by the Chief of Naval Operations (CNO) to initiate process improvement projects. The authors gathered data through interview and examination of process improvement team records. Information is anecdotal and is presented as "lessons learned."

The authors found that there are no essential differences between operational units and shore support commands with regard to **requirements** for TQL education, training, and implementation, although there are differences in how these activities are conducted. They also found that successful initiation of TQL practices depends heavily on the leadership style of the commanding officer and on the culture of the organization.

Background

Until 1991, there had been no systematic application of TQL concepts and principles in fleet operational units. To identify specific fleet implementation issues, the CNO initiated process improvement projects. The TQL Office, Office of the Under Secretary of the Navy, was tasked to train 20 military personnel the CNO had hand-picked from the aviation, surface, and submarine communities. The intent was for them to serve as consultants to 11 operational units, called "demonstration units," to assist with initial process improvement efforts. These "demo" units, also selected by the CNO, reflected the three warfare communities.

Training of the teams took place at the Navy Personnel Research and Development Center (NPRDC) for 90 days between January and April 1991. Trainers included staff from both the TQL Office and from NPRDC. The curriculum covered theory and principles of TQL, team skills

and concepts, leadership roles and responsibilities, quantitative methods and tools for process improvement, the seven management and planning tools, and implementation planning. The teams made site visits to Balboa Naval Hospital, Mare Island Naval Shipyard, McClellan Air Force Base, and Sacramento Army Depot, and attended a 4-day Deming seminar.

Following training, five CNO TQL Fleet Teams were formed based on their community affiliation—three teams (aviation, surface, and submarine) were assigned to Norfolk, VA, and two teams (aviation and surface) to San Diego, CA. Between summer 1991 and spring 1993, the CNO TQL Fleet Teams provided education, training, and consultation to the demo units and to some additional units as time permitted. Since that time, the teams have served as consultants to fleet units requesting technical help.

Method

The authors interviewed the CNO TQL Fleet Teams and demo unit representatives on both coasts in March, September, and October 1992. USS TRENTON was visited on deployment in September 1992. Not all of the units were available for interview because of deployment schedules. Those interviewed were:

Atlantic: Helicopter Combat Support Squadron EIGHT, USS EMORY S. LAND, USS TRENTON, and Headquarters Support Activity, Norfolk, VA.

Pacific: USS McKEE, Helicopter Anti-Submarine Squadron TEN, Helicopter Anti-Submarine Squadron Light FORTY ONE, and Air Anti-Submarine Squadron FOUR ONE.

The authors met with individuals from all levels in the command, including commanding officers and TQL coordinators to explore how TQL was being applied in the fleet. Four basic questions were asked:

- 1- How does the leadership style of the top leader affect TQL education and training as well as implementation of process improvement efforts?
- 2 What is the influence of the Navy culture on TQL training and implementation? What is the influence of TQL on the Navy culture?
- 3 What are the fleet requirements for TQL education and training? How have they been conducted?
- 4 What are the fleet requirements for TQL implementation? How has implementation been conducted?

Lessons learned" were extracted from the answers.

Lessons Learned

"Lessons learned" are defined here as interpretations of events within the context of TQL theory. They are organized around the four questions. A supporting quotation follows most of the lessons learned. In many instances, the quotation reflects opinions expressed by more than one person, that is, it represents a collective view. TQL in the Fleet: From Theory to Practice offers a more complete record of supporting quotations.¹

How does the leadership style of the top leader affect TQL education and training as well as implementation of process improvement efforts?

• An organization's readiness for change is CO/XO-dependent.

"Once the CO and XO began to lead executive meetings focused on quality, more progress was made in a 3-week period than had been made in the previous 18 months."

• Continued progress in TQL is dependent on the attention and commitment that a new CO brings to a command.

"Many of the demo units have gone through a change of command since TQL training and implementation began. Where the new CO has shown interest in process improvement efforts, progress continues. Where the CO has shown little interest, progress stops."

• The atmosphere established by the CO has a tremendous influence on how teams function. The CO influences whether or not everyone's opinion has equal weight and whether or not decisions are reached by consensus.

"COs have to work hard to avoid dominating team meetings and having their opinions come across as directives. The wise CO is aware of the influence he or she is exerting on the group and acts accordingly."

• Receptivity to change generally increases as the work experience of the CO increases.

"A CO who is on a second or third command has a different 'comfort level' than one who is on a first command. Generally speaking, the more experienced CO is better able to handle operational pressures and may be more willing to entertain new ideas and ways of

¹TQL in the Fleet: From Theory to Practice (J. Wasik & B. Ryan) is available through the Defense Technical Information Center, Stock No. ADA 275444 (703-274-7633 [DSN 284-]).

doing things. At the other end of the experience spectrum, a CO who is about to retire may not be as receptive to change because he or she will not be around to see the change through and may want to leave decision-making on major issues to the individual rotating into that position."

What is the influence of the Navy culture on TQL training and implementation?

• Top leaders must understand and communicate that change is neither quick nor easy.

"Change is a slow process. Even with top-down commitment and the knowledge that TOL will work, change comes over time in small steps."

• People are reluctant to try new things because they are afraid of making mistakes.

"Most people appear to be very positive when you ask, 'How many of you would like to work in an organization where everyone has a say?' Even though people would like to work in this kind of climate, when it comes time for them to change, they are resistant. People perceive that the risk is too great to do something that is unfamiliar."

• The reduction of fear is necessary to create a climate of trust and cooperation where system optimization can occur.

"People are less fearful and more readily accept TQL as a management approach once they see how it benefits them and their organization. The better the understanding, the more supportive people are of team efforts."

• Units need to understand the influence of Navy culture on their readiness for change before initiating process improvement.

"Organizational assessment is very important. It can tell you, for example, whether the organization is customer-oriented. People need to realize that an organizational assessment is not a pass-fail test."

• Operational pressures affect the focus that fleet units bring to TQL training and implementation.

"You are always under the gun to prepare to deploy. TQL should not be another block that is checked off in the predeployment workup; it's a whole new way of doing things. People understand this intellectually but lose sight of it because of operational pressures. These pressures come from inspections and sea-time preparation."

• Deployment schedules and operational commitments affect the progress of process improvement efforts.

"At sea, operations can affect the progress of process improvement. On a carrier, for example, it's too expensive not to fly, so crew commanders will not usually be available for team meetings when conditions for flying are favorable. Getting team members together on any kind of regular basis is an ongoing challenge."

"Initially what you do to support TQL and process improvement and what you sometimes have to do with your day-to-day operations when deployed can be different. For example, when we sit down as a new team and say, 'Let's figure out how to make sea-and-anchor detail more efficient,' everyone on the team has a say. But when the captain says, 'Set the special sea-and-anchor detail and get under way,' we do just that. We don't sit down and discuss it first."

• Military job rotation has a negative effect on productivity and maintaining constancy of purpose.

"If you were to bar graph the performance of many individuals over the course of their military careers, it would probably look like a bell curve. The individual comes into a job, sometimes with little knowledge. It can take several months for him or her to become familiar with the new position, but finally that person becomes highly productive, at which point he or she is rotated to a new position. They're rewarded for rotating. Promotions are often given to military personnel who have excelled in many different jobs and are willing to change their jobs frequently for advancement. This ultimately has a negative bearing on productivity and maintaining constancy of purpose."

• Ranking of personnel undermines cooperation and team efforts.

"As downsizing continues and competition for jobs increases, the issue of cooperation vice competition becomes more acute. It may become more difficult to persuade people to work together in teams—to share information—when they are being ranked, one against the other, for promotion."

What is the influence of TQL on the Navy culture?

Working in teams is not new in the Navy; what is new is how teams interact.

"It's okay now to have a different opinion. This is a new concept in the Navy. People are more willing to express ideas than they were in the past because they believe their ideas will be looked at seriously in a team setting."

• TQL shifts negative attention from the individual to the system.

"The job of plane captains is to inspect aircraft before the pilot takes off. The time-traditional method for training plane captains was to select someone junior and assign him or her to a team to learn how to do the job by observing other team members. This was an extra task for the senior person and training was haphazard. No real process existed to ensure good training. To solve this problem, a school for plane captains was organized. Prior to this change, people would point fingers at people if there were problems with an aircraft. Now if there are problems, the training process is examined."

• If the steps in a stable process are correctly flowcharted and documented, most people new to the job can begin working efficiently and effectively.

"It can take several months to become familiar with a particular work process. However, if a new person walks into a situation where the process has been properly identified, he or she can learn the system much faster. This saves time and money."

What are the fleet requirements for TQL education and training? How have they been conducted?

• When initial training is spread out over too long a period of time, learning is compromised.

"The best way to conduct initial TQL education is over a 1-to-2-week period. It improves retention of material learned earlier in the session and reduces classroom interruptions caused by new personnel coming into the unit. New people should be trained in a separate session."

• The teaching of TQL theory and philosophy can be conducted with large groups, representing a savings of both time and money.

"Large group training offers an opportunity to consolidate resources. For example, TQL theory and philosophy can be taught to several newly formed teams or management levels (e.g., all department heads) across organizations that are located in the same geographic area or are part of the same battle group."

• Teambuilding skills training should be conducted with people who are planning to work together on a process improvement effort.

"Process improvement teams need early training in team skills to function effectively. It is especially important if all of the TQL training has not been completed prior to deployment. People are learning about a new way of interacting with one another, essential to success as team members. These skills also make it easier for a team to discuss the TQL concepts learned in later training sessions."

• Learning is enhanced if there is time for people to discuss the concepts, for "incubation" to take place, and for their knowledge to be applied in training exercises.

"Because there is fear that TQL education will not continue once deployed, there is pressure in units to complete it as soon as possible. The application of the knowledge through training exercises may be deleted from TQL education because of time constraints. Learning is compromised when this occurs."

• TQL education and training can be laid out in different ways to accommodate operational schedules.

"Flexibility in scheduling instruction is essential because of operational requirements. Some training may be split between predeployment and deployment. Some instruction may have to occur in segments of varying length. The TQL curriculum is organized by lessons and modules, making it relatively easy for trainers to present material segmentally."

• Different platforms have different missions and, therefore, different requirements. As a result, training opportunities will vary from platform to platform.

"For an aviation unit, the only time available in port for TQL training is coming off a cruise, and that period lasts for about a month. After that period there is continual maintenance and flight crew training to prepare for the next deployment. When a carrier is deployed, the pilots sometimes spend only half of their days flying. That leaves some time to schedule TQL training for pilots and other personnel over a 180-day deployment."

"In surface units, a 'yard' period is a better time for training than a full 'tempops' period. Training was easier to schedule in the shipyard. We were able to get teams together for an hour or two at a time. Once we went to sea, training slowed down dramatically. There is one exception: If the ship is undergoing a major overhaul and ship personnel are doing much of the work, training might be difficult to schedule."

"Because of the work schedule that people have during deployment, they sometimes have only 3-4 hours of sleep in a 24-hour period. With operational schedules like this, training for those personnel has to wait until the unit comes off deployment."

"The submarine environment impacts availability of personnel. There are fewer people to 'siphon off' for training. Someone who already has a critical job, which may take 16-20 hours/day, is not available to conduct or receive training in a large block of time."

• The CO needs to attend the Senior Leader's Seminar and continue self-education in TQL to provide the necessary leadership and to ensure successful TQL implementation.

"The Senior Leaders Seminar provides essential TQL education and training for leaders. While in attendance, COs have an opportunity to interact with each other, a valuable

experience that reinforces commitment to TQL. TQL education does not end with SLS. COs also need to seek out other materials (e.g., readings, videotapes) to increase their understanding of this complex approach and to provide guidance in its application within their commands. COs should attend some of the command-level TQL training provided by their own trainers."

• For training purposes, both military and generic examples of TQL applications have value.

"Early in the training, military examples can lead to confusion when they don't apply to every situation. If examples are too specific, classes may focus more on the details than on the message. To avoid confusion in a training situation, generic examples should be followed by military examples once there is some understanding of the concept being taught. Examples should come from all the different communities to make training more relevant."

• Insufficient knowledge about TQL concepts and their application among newly formed process improvement teams or new members can lead to a rice bowl mentality.

"Newly formed teams that are working on related efforts may have some difficulty in sharing information because of a culture that encourages competition. As knowledge about TQL concepts increases, team members see the benefits of cooperation."

What are the fleet requirements for TQL implementation? How has implementation been conducted?

• Selection of a TQL coordinator is indicative of the importance that the organization places on TQL and is critical to an organization's progress.

"Success as a TQL coordinator is more a function of initiative and commitment than of rank. However, if the position is a military one, the CO's visible support for that position is critical to successful implementation. The TQL coordinator should also be well respected within the organization, someone who can carry on the initiatives as leadership rotates."

• TQL coordinators describe the requirements for successful TQL implementation:

- "Firm direction from higher-level teams to lower-level teams"
- "Structured team activities"
- "Constant reference to the implementation plan to guide efforts"
- "A reliable communications system"
- "Careful selection of the linking pin and clear definition of that role"
- "A charter for all teams"
- "Leaders who 'walk the talk"
- "Executive Steering Committee (ESC) members who do not delegate ESC-level

responsibilities"

"ESCs that set realistic deadlines"

• Memorandums of Understanding (MOUs) are useful in establishing a positive relationship between an organization and its consultants and even between it and its TQL staff as the organization begins to implement TQL.

"MOUs can be used to clarify issues, such as confidentiality, to get concerns and fears out on the table for discussion, and to spell out what each party expects from the other. Once trust is established, MOUs may no longer be needed because everyone knows what to expect. Other MOUs might be modified with time."

• An organization's Executie Steering Committee must set boundaries for its process improvement teams.

"It is the ESC's job to break down the organization's strategic goals into manageable tasks for its teams."

• Chartered teams do a better job of planning and conducting process improvement than teams lacking written guidance.

"Team charters provide guidance and operational definitions, reduce the risk of suboptimization, and ensure the team has the cooperation and resources to do its work."

- Early implementation efforts should focus on process improvement rather than strategic planning.
- Improvement efforts that have been well documented will most likely survive changing team membership.
- Ideas for initial process improvement efforts should come from all levels of the organization.
- The same person should not serve as the upward and downward link because of a possible filtering of information.

"Team participation can be impeded when the same individual `links' up and down. The filtering of information or a perception that information will not be accurately transferred between higher and lower level teams can reduce team effectiveness."

[&]quot;Elimination of fear from the workplace"

[&]quot;Continuing TQL training for themselves"

[&]quot;An understanding throughout the organization that group efforts take more time initially than individual efforts, but that the payoff is far greater in terms of process improvement and buy-in"

• The team structure and membership must take into account the size and complexity of the command.

"The size of the unit can change with deployment, affecting team membership and group dynamics. Teams formed in port may not have the same members onboard during deployment, making progress difficult."

- A strong link between a unit's implementation plan and the various process improvement teams needs to be maintained to ensure a sustained commitment to command goals.
- Process improvement teams should consider inviting the customer to participate in team meetings when appropriate.

"After initial process improvement changes have been implemented, customers can help a team evaluate the success of change and provide input for additional improvement."

• The need for facilitation skills may not diminish with time because of deployment and the military rotation policy, which can work against team maturity.

"TQL staff members may need to spend more time facilitating process improvement teams when there is a high turnover of membership and when continuity of team activity is difficult to sustain because of interruptions."

• ESCs should be alert to the impact of process improvements on other processes within the organization to ensure optimization of the entire system.

CLOSE

Almost all of the lessons learned and concerns raised by the fleet units during this study are addressed in the Department of the Navy TQL education and training courses. Because the lessons learned described here were developed over time, it was possible to incorporate some of these new findings into courses undergoing revision and to give fresh emphasis to those areas important to fleet units.

A number of concerns will "correct" over time. For example, military job rotation can have a negative effect on productivity and maintaining a constancy of purpose, but only over the short term. As critical mass builds, COs and others rotating into new leadership positions will arrive knowledgeable about TQL and its proper application.

The lessons learned reported here were the result of a study conducted over a 7-month period that ended in 1992. What has happened since then? What new lessons have been learned as organizations mature and others begin the "journey"? A draft report entitled *Total Quality*

Leadership: Success Stories and Lessons Learned (Office of the Chief of Naval Operations, June 1994) offers up new stories from shore-based and headquarters activities as well as from operating forces. New lessons learned from the fleet follow:

- 1. TQL not only supports the chain of command, it strengthens it through increased communication up and down and across commands.
- 2. Successes need to be publicized. They give recognition to those who have had the courage to analyze and improve the way their work gets done and they give encouragement to others to begin.²
- 3. The command needs to establish a clear policy on attendance at TQL meetings. A "no substitute" rule ensures that the right people will always be at the meetings and that member responsibilities will not be delegated. The rule also reflects organization-wide commitment.
- 4. People who question the value of TQL may not understand how it works. Not all learning will come about in the classroom. Often the "doing" is what leads to understanding.
- 5. COs should direct second-generation quality initiatives at more complex processes.
- 6. Even without TQL education or involvement on a team, individuals will buy into quality if they can see how it benefits them. For this reason, a command's earliest improvement efforts should include some processes that address quality of life.
- 7. A program that allows people to submit ideas for process improvements is an easy way for juniors to communicate with seniors as TQL gets started. Quick response is essential for its continuing success.
- 8. TQL tools have great usefulness in improving processes on a continuing basis, but they can also be appled to facilitate a single event, such as helping a squadron to transition to a new aircraft carrier or to relocate to a new base.
- 9. While some TQL efforts can be tied directly to operational readiness, others have an indirect, but nonetheless powerful, effect. TQL, for example, leads to improved communications and morale, which by themselves will increase readiness. The extent of their contribution, however, cannot be measured.
- 10. The lessons learned from the fleet experience apply equally to all other work settings--to shore-based activities, to headquarters, to industrial sites.

The final lesson learned is probably the most important one of all, and the implications are farreaching. A single curriculum can continue to serve the entire Department of the Navy. The

²Successes, however, need to be evaluated within the context of TQM/TQL. For example, tiger teams, while effective for what they do, are not process improvement teams.

implementation approach does not require redesign. Deployment schedules of fleet units must, of course, be accommodated for learning purposes, but courses were designed with that in mind, with segments organized by lessons and modules. Fleet process improvement teams meet whenever and as often as they can, but that is a reality of shore commands as well.

This final lesson says something about TQL. Perhaps it can work in any setting, in any organization, because the concepts and the practices associated with it are universal.

Transforming The ACC IG



Col David C. Kolodzinski

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Colonel Kolodzinski, nicknamed "K+10," is married with three children.

TRANSFORMING THE ACC IG

Colonel David C. Kolodzinski HQ ACC/IGP

ABSTRACT:

Historically, the Inspection System has consisted of functionally oriented management inspections tied to compliance checklists and predictably orchestrated Operational Readiness Inspections (ORI) for units with wartime taskings. Although the management focus shifted over time toward leadership and overall unit effectiveness and mission efficiency, it was not until the summer of 1992 that Unit Effectiveness Inspections (UEI) were renamed Quality Air Force Assessments (QAFA) and the inspection processes themselves began to evolve. The previous system of observing, validating, and reporting results within a highly defined grading system was well structured and professionally executed, but very costly in terms of manpower and fiscal resources. At the same time, the Inspector General (IG) image was gradually shifting from the dreaded "black hat" to one of evaluator/teacher, sharing information to crosstell "best practices" within the command.

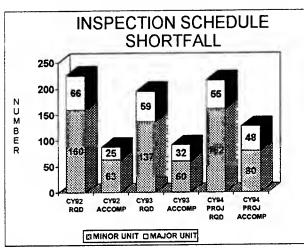
In December of 1992, COMACC directed that Quality Air Force Criteria (QAFC) be used as the framework for Air Combat Command's (ACC) QAFA and work began to change the IG's management inspection. Another factor, the number and diversity of units within the command, had finally exceeded the IG team's ability to meet its schedule within the 4-year inspection cycle. Additionally, a mandated two percent ceiling on the MAJCOM HQ staff versus command population prompted extensive analysis of manpower reductions which could only exacerbate the IG's scheduling shortfall. Given all these significant factors, the ACC/IG proposed to the ACC Quality Improvement Council (QIC) that a cross-functional team be chartered to develop and evaluate new methodologies to improve the inspection system. COMACC approved this approach in order to evaluate the full array of options to methodology and weigh potential benefits and detractors to determine the future roadmap for the IG--into the year 2000 and beyond. This paper relates the Inspection/Assessment Quality Improvement Team's (QIT) four month quality journey to "Transform the ACC IG."

BACKGROUND:

During Headquarters ACC's 1993 Resizing QIT, a subgroup was tasked to investigate potential manning efficiencies within the IG directorate. This group (designated T-20) recommended two major options which would allow significant reduction of manpower authorizations (68 and 96 out of 255) within the IG staff. Although an extensive piece of work, its recommendations were not accepted by the "process owners" because the study linked modified ORI and QAFA methodologies, applied performance factors to determine the inspection interval, and the full array of possible options had not been examined. In the end, across-the-staff "salami slices" of 10 percent for FY94 and 12 percent for FY95 were applied to each directorate's authorizations and

the work of T-20 was put on the shelf; however, it highlighted the need for further study to improve inspection methodologies and identify manpower efficiencies.

In the coordination process of reviewing the IG's annual inspection schedule, it became apparent that for the past 3 years, and again in CY94, the team could NOT meet its inspection completion goal. In fact, using a best case annualized model no more than 48 of 55 major units (group level and above) and 80 of 162 minor units (squadron and below) could be evaluated by the end of CY94 (Figure 1). An additional 10 major organizations were also identified as overdue yet unavailable for inspection in CY94 due to real world conflicts or other commitments. From CY93 to CY94, the IG Team's inspection capability increased 39 percent (Figure 2); however, this still fell short. To resolve this significant scheduling problem, the ACC QIC chartered the Inspection/Assessment QIT, led by myself, to identify potential improvements.



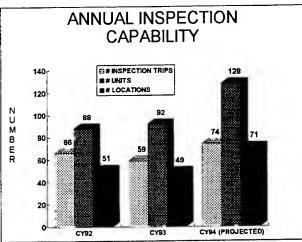


Figure 1: Model of Insp Rqd vs Accomp

Figure 2: IG Maximum Annual Capability

QIT CHARTER:

PURPOSE: Provide the ACC Quality Improvement Council recommendations based on an array of inspection/assessment options with pros and cons of each including manpower savings.

OBJECTIVES:

- 1. Review ACC's inspection/assessment mission, philosophy, methodology, and regulatory requirements.
- 2. Develop and evaluate options for revising current methodology to increase efficiency while retaining or improving effectiveness.
- 3. Make specific recommendations for changing current methodology.
- 4. Evaluate processes to insure customer needs are being met.
- 5. Develop a time phased outline of steps to improve processes.

PARAMETERS:

- 1 Recommended Solutions:
 - a. Must ensure a valid assessment of combat capability (ORI).
 - b. Must measure unit effectiveness within the quality framework (QAFA).
- c. Must meet statutory or mandated requirements, Nuclear Surety Inspection (NSI), Coronet Lightning (CL), Alert Force Evaluation (AFE).

- d. Must be consistent with ACC's quality culture.
- e. Must be executable within resource constraints.
- 2. Be cognizant of HQ ACC's manpower constraints; attempt to take work out which will eliminate 20-30 percent of the resources required (manpower, money, or material).
- 3. Report to HQ ACC QIC at the mid-point of the analysis and at the end of the study.

ADMINISTRATION:

QIT membership consisted of HQ ACC directorate representatives from: IG, CE, LG, DO, SC, SG, HC, SV, IN, XP, and SP, plus 1 FW CVX as spokesperson for the active and gained units. Responsibilities, empowerment, milestones, and schedules were established, plus "just in time" quality training for those individuals uncomfortable with their knowledge level of related subjects. The team was empowered to make recommendations to the ACC QIC, consult experts, and task the staff, including IG team members, to provide supporting information.

DATA GATHERED:

Information and resource requirements were identified through brainstorming and use of an affinity diagram. In order to completely review IG mission, philosophy, and methodologies, background informational requirements were determined to be: regulatory guidance, a survey of key customer needs and levels of satisfaction, comparison data of other MAJCOM IGs, manpower documents, schedule limitations, and flow-charted ORI and QAFA methodologies. As the QIT's analysis continued, command-to-command memorandums of agreement (MOA) were reviewed and compliance inspections performed by other than the IG were examined. They included: Environmental Compliance, Assessment and Management Program (ECAMP); Health Service Inspection (HSI), Quality Education System (QES), Childcare Development Center Accreditation, Stan/Eval Visit, Nuclear Surety Staff Assistance Visit (NSSAV), and Civilian Personnel Office (CPO) QAFA.

BENCHMARKING:

An IG working group built a matrix of data from MAJCOM IGs worldwide to compare manning, augmentation levels, workload, team sizes, methodology, and inspection cycle. A review of the data revealed the following key points: (1) other IGs typically inspect with much smaller team sizes, (2) they augment at significantly higher rates from a trained manpower pool, (3) some IGs forecast their schedule much further in advance, (4) one IG conducts ORIs during JCS-funded exercises, and (5) not all IGs use the QAFC for QAFAs.

To compare ACC's Unit Self-Assessment (USA) and QAFA methodology to similar programs in industry, the QIT invited a traditional guardsman, trained as a Baldrige examiner for AT&T and versed on the QAFA, to address the applicability of the USA to military organizations. The key points he made indicated to the team that the USA has great utility if used to improve process quality, customer satisfaction, or people programs. Ninety percent of the annual AT&T effort is oriented toward improvement, not awards. To prepare for the site visit, examiners may spend up to 140 hours of voluntary study to identify validation items and feedback for corrective action.

Scores are not published, as in ACC, but the organization knows where it stands relative to others, again similar to ACC. The QIT was not ready to agree to six examiners validating the USA of a 5000 person wing, let alone a 30,000 industrial subsidiary as AT&T does, but developed a better sense of the value of USA validation.

KEY CUSTOMER SURVEY:

Recognizing that command IG guidance was ill-defined, fragmented, and in some cases dated, the QIT determined that inputs from experienced leaders, staff and command-wide were needed. The QIT developed a survey which was sent to a focused population of key IG customers, primarily wing commanders. HQ staff directors and division chiefs received the survey via Local Area Network, while active and gained units were sent a message released by ACC/CV. Individual responses ranged from strictly numerical scores to as many as 24 pages of comments. A total of nearly 600 separate comments were reviewed three times to capture key points for their application to possible solutions. The QIT used the survey to (1) measure customer satisfaction with current methodologies, (2) identify potential key process improvements, and (3) ultimately develop supported recommendations to the QIC. Respondents were instructed to use the following rating system to respond to questions: (N/A) Not Applicable, (1) Strongly Disagree, (3) Neither Agree Nor Disagree, (4) Agree, and (5) Strongly Agree. Twenty-five questions addressed: the inspection cycle, ORI, QAFA, NSI, CL, and AFE. Comments were solicited for each question. Total sample size was 150 sent, 141 received. Results were arrayed by response percentages, broken down by staff, active, and gained units for comparison. For dissemination to the directorates, comments were condensed to one page per question, again arrayed by type unit. An example follows in Figures 3 and 4.

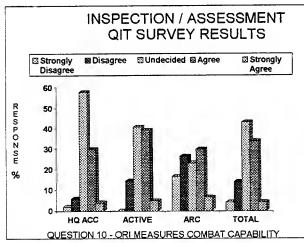


Figure 3: Survey Response Depiction

ORI MEASURES COMBAT CAPABILITY

- HEADQUARTERS ACC
 - NEED JOINT OPERATIONS FOR REALISM
 - NOT A PERFECT SYSTEM, BUT DOES THE JOB
 - MAJORITY UNDECIDED (OWNERS OF CRITERIA!)
- ACTIVE UNITS
 - ORIS TOUGH, BUT CAN'T MATCH THE TASKING
 - OK, BUT END-RESULTS FOCUS IS NEEDED
 - TOO MUCH EMPHASIS ON NON-WARFIGHTING ATSO ISSUES
- AIR RESERVE COMPONENT UNITS
 - ORI = GAME WITH ATSO OVERDONE, ESP CHEMS
 - SCENARIOS NEED A "REALITY CHECK"
 - NO TIME TO TRAIN FOR THE "GAME"

Figure 4: Condensed Survey Comments

The survey results were vital to the process of developing potential solutions and later supported the QIT's consensed recommendations. Because the survey was sent early in the process, it allowed the QIT to ask thought provoking questions, without soliciting favored responses. Based on the surveys, key customer areas of overall agreement were identified as: inspection timing based on weighted criteria has merit, simultaneous inspections should be performed when possible, Operational Readiness Exercises (ORE), unit conducted training exercises, validated by

the IG are as good a wartime readiness measurement tool as the ORI; exercises and real world events are far better measurement indicators of a unit's combat capability than the ORI, the USA measures continuous improvement, the IG should validate the unit's USA with a much smaller QAFA team, ORI criteria should focus on measurable mission end-results, and ORI scenarios should be more realistic.

OPPORTUNITY IDENTIFIED:

An opportunity statement was established as "The inspection/assessment process can be improved to meet customer needs." Processes were defined, and the QIT agreed that improvements should (1) increase customer satisfaction, (2) result in optimal cycle times, and (3) use resources efficiently. A classic "fishbone" was built (Figure 5), using 21 consensed root causes of why the "as is state" fell short of the "ideal state." The OIT used an ideal state very close to the IG Mission Statement: "Air Combat Command's Assessment and Oversight Team educating, motivating, and independently evaluating...to

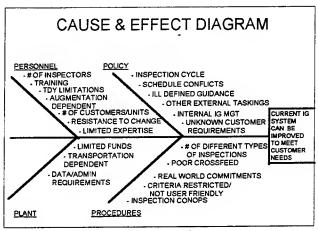


Figure 5: Fishbone of Root Causes

improve the capabilities of our Combat Air Forces."

An ID Matrix was used to indicate the cause/effect relationship of the 21 root causes. Then, a pareto chart (Figure 6) was developed to analyze "key drivers" in the hope that a "significant few" could be identified. Instead, 11 drivers were determined to be causing 80 percent of the problems. The bottom ten were eliminated by consensus; and by multi-voting on the top 11, the following seven key drivers were identified: inspection methodology, number of customers/units, criteria, number of inspection types, IG management, real world impacts, and cycle time.

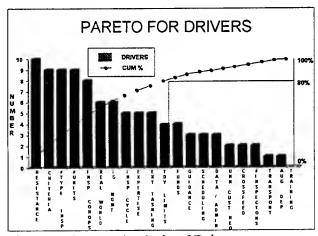


Figure 6: Pareto Analysis of Drivers

POSSIBLE SOLUTIONS:

To fix the IG schedule shortfall, factors impacting the process were identified. They were determined to be: the bow wave created by the post Operation Desert Storm one year grace

period for participants, force structure changes (60 programming plans in 1993 alone), equipment and aircraft conversions, the IG temporary duty (TDY) manday goal of less than 120 days annually, the IG augmentation goal of less than 15 percent, absence of IG teams at 1 AF and 8 AF (their gained inspections were being performed by ACC IG), and deconfliction requirements including real world taskings, training exercises, and Air Reserve Component (ARC) Unit Training Assembly (UTA) long-range scheduling requirements. In the course of examining these factors, the QIT identified three areas for improvement to the IG. They included: average TDY manday figures well below 120 for the past three years, large number of vacant manning authorizations, and lack of a trained manpower augmentation pool. The QIT felt the following key process drivers were outside its influence: internal IG management procedures, published criteria, and number of customers/units (except as related to 8 AF gained). Number of types of inspections would be examined to determine whether the CL Inspection and the Phase I could be combined for units with OPlan 79 "show of force" tasking. The inspection cycle was only examined after the manpower analysis, to determine whether the shortened cycle was feasible within manyear availability after downsizing and return of 25 manning authorizations back to 8 AF. This left INSPECTION METHODOLOGY as the primary area where the team felt they could recommend productive changes.

By comparing the man-days expended on each of the six types of inspections (QAFA, ORI, CL, AFE, NSI, Air Defense Exercise (ADX), the QIT decided to concentrate study on the QAFA and ORI as the primary inspections where improvements had the potential for greatest impact (Figure 7).

Statistical sampling formulas were studied to determine their applicability to grading with reduced observations by inspectors. Since events such as Integrated Combat Turnarounds (ICT), scrambles, deployment airlift on-time takeoffs, or mission employment success are scored on a pass/fail basis, a "size

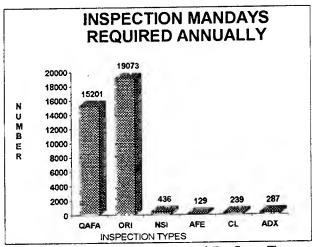


Figure 7: Annual Mandays Rqd By Insp Type

of the sample for proportions" equation was chosen. Such an equation determines sample size based on historical proportion of success rates relative to total attempts. The QIT equated historical success to the high end of the Satisfactory range in grading and demonstrated to the IG team that they were already applying smart sampling with a 95 percent confidence factor in areas such as pallet teardown for inspection. Application of sampling techniques will be important for inspectors to "do the same smarter with less."

The QIT brainstormed 246 potential solutions to improve the QAFA and ORI methodologies. Using an affinity diagram, the ideas were consolidated to 166 inputs and arrayed by QAFA and ORI under the key drivers previously identified. Survey results were then applied to the solutions to formulate options for discussion and final resolution.

EVALUATION/SELECTION:

Potential QAFA solutions were narrowed to 134 possibilities, with the toughest being the requirement to verify functional compliance versus a better system of measuring efficiency and effectiveness within the quality framework. QAFA options were identified as follows:

- A. Current 120 inspector QAFA using Assessment Guides (no change).
- B. QAFA with greater compliance vice QAFC focus.
- C. IG validate USA with 30 assessors on site.
- D. HQ functional staff validate USA with 30 assessors on site.
- E. QAFA downsized like Baldrige Award visit with 7 assessors on site.
- F. USA only (relying on commanders), no QAFA.

Potential benefits and detractors for each option were then listed and discussed. Based on ACC's style of quality, survey results, and the need to project QAFA methodology into the future, Option C received the most positive votes when measured against the original parameters in the charter. The cornerstone of this option is greater reliance on commanders at all levels to perform a comprehensive USA, identifying key strengths and areas for improvement, to measure and promote greater efficiency and effectiveness. The functional staff agreed they should also review their respective USA inputs, e.g., CES, SPS, or LSS. The IG will continue to review the USA, followed by a field validation of unit strengths and areas for improvement under each of the QAFC seven categories. QAFA team size was designed to still allocate one or two functional experts to each squadron within the organization for credibility and greater crosstell of information.

Quality improvements to the ORI measurement of wartime capability were more difficult to build upon. The current methodology, relatively unchanged for 20 years, has many benefits, despite its high resource requirements. Training for the ORI provides leaders a time-proven formula for success, across their entire unit. The QIT's goal was to apply a parallel quality focus to the ORI by increasing accountability, along with trust and empowerment, of commanders to demonstrate their wartime capability. In fact, during periodic OREs, this is expertly done, but without outside observation or critique. The QIT developed a roadmap for gradual change, plus some "stretch goals" to focus on more fact-based grades. ORI options were identified as follows:

- A. IG inspects a delinked (in time) generic Phase I (Initial Response) with a small team of 15-20 for three days; a separate Phase II (Employment) would consist of a "bare-bones" team of 69 using greater sampling to observe both day and night shifts.
 - B. Same as A plus use deployments, exercises, or OREs as a Phase I (when prudent).
- C. Same as B except validate the Phase I using end-results criteria without interrupting ongoing processes to "inspect" aircraft, pallets, documentation, etc.
 - D. Use the ORE, jointly planned by the unit and staff, as the vehicle for delinked phases.
 - E. Same as D plus use exercises and deployments, if available, for Phase I.
- F. "Stretch goal" ORI to evaluate multiple units deployed to a site capable of using instrument ranges for employment Phase II.
 - G. Current ORI methodology and criteria without changes.

To narrow down the options, a multi-vote technique, using weighted measurements, was performed. Each member voted for four of the options under each measurement. Options C, D, E, and F remained; they were then rank ordered by using the nominal group technique, with the weighted factors again applied to the scores. Options D and E received the highest acceptance, with Option F a close third; therefore, the QIT decided to base ORI recommendations on a phased approach, i.e., what can be implemented now, what should be tested and validated prior to implementation, and what is the "stretch goal" for the future?

DECISION PROCESS:

Prior to presentation of the recommendations to the QIC, a modified Process Decision Program Chart (Figure 8) was developed to: determine stakeholder level of buy-in, assess feasibility of options, identify overlooked options and pitfalls, and respond to senior leader concerns and questions. Formal meetings were conducted with key division chiefs and informal presentations were made to directors by their respective OIT member. Manning requirements were depicted after analysis using an Excel spreadsheet model. The "soup to nuts" briefing, with "draft recommendations," was presented six times during the decision process, prior to the QIC briefing.

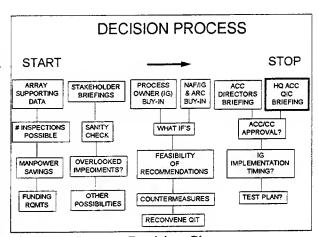


Figure 8: Process Decision Chart

During the course of these briefings, key stakeholder discussion centered on the following questions: Who is responsible for compliance? What about QPM reviews and weighted performance factors for inspection timing? Is sampling acceptable? Can we grade on mission endresults vice reviewing every process? How much burden do we shift to the wing commanders to measure combat capabilities during OREs? What are the "additive manning" possibilities to robust the IG team during OREs? Why not eliminate NAF IG teams and absorb their manning authorizations and responsibilities at the MAJCOM? Should ACC revert to a 3-year vice 4-year inspection cycle? Where applicable, fact-based responses were provided.

FINAL RECOMMENDATIONS:

The recommendations which follow were presented by the QIT. They covered a broad range of topics and ALL were approved by the QIC for either further analysis or implementation.

1. The QAFA should change to an on-site validation of the USA by a smaller team. Compliance is to be reviewed only "where required," i.e., mandated by public law, Congress, DOD, OSHA,

- etc. This change promotes and reinforces ACC's quality culture of trusting commanders, promoting teamwork, and measuring continuous improvement.
- 2. The ORI Phase I (Initial Response) and Phase II (Employment) should be delinked (in time) when smart, for manning efficiencies and use of scheduled deployments or exercises. The Phase I, which may be a CL inspection if tasked, requires only 15-20 inspectors while the Phase II can be performed with 69, using greater sampling. The Phase I should become a limited notice (72 hour) evaluation for active units, while the Phase II should remain notice via an annual schedule.
- 3. The ACC IG should test and validate a concept to use unit/IG jointly planned wing generated OREs as the vehicle to conduct the inspection, using additive Exercise Evaluation Team (EET) manning from within or outside the unit.
- 4. ACC/IG should perform Combat Communication and Theatre Air Control System OREs during exercises to support a customer, with the intent of added inspection realism.
- 5. ACC/IG should perform C-130 ORIs during JCS-funded exercises to provide an actual Army customer. ACC exercise policy historically separated evaluations from training events; however, AMC proved that to have scenario realism, it was necessary to get units "force listed" and evaluation events coordinated during major exercises. During 1994, by MOA with AMC, ACC was to use AMC's schedule and criteria. For 1995 and beyond, the QIT felt strongly that C-130 ORIs should not become less realistic or less tactically oriented, hence the recommendation.
- 6. A "stretch goal" was to develop the ability to ORI multiple units simultaneously and include ARC units with active as they would go to war. Gained forces have had to unrealistically train selected individuals in support roles (vice wartime tasks) in order to complete stand-alone ORIs.
- 7. ACC/IG perform Emergency War Order (EWO) nuclear generation phase I evaluations for dual role bomber units during designated quarterly Crown Vigilance exercises, as an "expanded NSI." These events have been performed regularly without IG observation other than by STRATCOM IG looking primarily at command and control. The QIT felt it was an evaluation opportunity being overlooked.
- 8. The ACC staff should review and rewrite ORI criteria to include C-130s, Air Rescue Service, and composite wings. Additionally, focus should be shifted to grading key mission objective endresults instead of every associated process.
- 9. Alert Force Evaluations of ACC gained air defense units should be conducted by NORAD IG, with periodic ACC IG observation, as the force provider. Since 1991 when 1 AF lost its IG manning authorizations, the evaluations were performed by TAC, then ACC, with redundant NORAD participation. A legal review of statutory responsibilities supported this recommendation since Air Defense Forces fall under routine operational control of NORAD.
- 10. ACC/SG should evaluate the concept of conducting an HSI or modified inspection during the parent wing's QAFA. The QIT felt that despite the differences and similarities of the inspections, it was inconsistent to exclude the Medical Group from a wing QAFA.
- 11. ACC/XP should allocate IG authorizations to 8 AF IG, to be consistent with current 9 AF and 12 AF IG manning. Since October 1993, ACC/IG has been conducting 8 AF's gained inspections as a test, with benefit of 8 AF's 25 manning authorizations. This additional load negatively impacted the scheduling shortfall because NAF IG manning is "bare bones" relative to the load, necessitating routinely high augmentation, unlike the ACC IG policy.
- 12. ACC/IG should perform a scheduling clearinghouse function to deconflict major inspections to include QES, HSI, ECAMP, NSSAV, CPO QAFA, etc. to minimize schedule conflicts and adverse impact on the units and inspection teams.

SUMMARY:

"Transforming the IG," was a challenge--to push the inspection system into the year 2000. Proven quality principles, tools, and techniques were used to generate "breakthrough" ideas among the 14 equally vital team members, seeking to improve on an accepted, entrenched, beneficial, but time-worn and uneconomical system. The next step for the IG is the implementation phase which has already been mapped out. The days of fearing the IG team are gone -- it has become an organization chartered to validate, measure, report, TEACH, and CROSSTELL BEST PRACTICES. Perhaps now, when the IG arrives, the wing commander can say "Glad you're here," and the IG can respond, "We're here to help," with neither gritting their teeth!

WORKS CONSULTED:

Brassard, Michael, The Memory Jogger Plus, Goal/QPC, 1989.

Electronic Systems Center (AFMC) & The MITRE Corp, <u>Air Force Process Improvement Guide</u>, Air Force Quality Center, undated.

Hirst, Susan et al, Forging the Future, Air Combat Command, Quality Improvement Group, 1993.

The Quality Approach, Air Force Quality Center, 1993.

Scholtes, Peter R., The Team Handbook, Joines Associates, Inc., 1991.

Total Quality Transformation, QIP, Inc. and PQ Systems, Inc., 1993.

USAs – ACC Style



Lt. Col Thomas P. Clarkson, Jr.

Lieutenant Colonel Thomas P. (aka "Pat") Clarkson, Jr., is currently Deputy Chief, Programs and Analysis Division, Office of the Inspector General, Headquarters Air Combat Command, Langley AFB, VA.

Pat enlisted in the USAF on 10 May 1966 and, after completing the Airman Education and Commissioning Program, earned his commission from Officer Training School on 2 October 1974.

Since October 1993, he has been deeply involved in building a subordinate Programs and Training Branch, and in developing and deploying ACC's USA Training Course. He is also a team chief and key instructor for the new course.

Lt Colonel Clarkson is married and has two children.

USAs - ACC STYLE

Lt Col Thomas P. Clarkson, Jr. HQ ACC/IGPD

ABSTRACT:

Quality Air Force Assessment (QAFA) and Unit Self Assessment (USA) became new household words for Air Force personnel beginning in January 1993. Many of these new quality-centered assessments, modeled after the new Quality Air Force Criteria (QAFC), measure an organization's efficiency and effectiveness both within and across its natural functional boundaries.

As some of the major AF commands (MAJCOMs) began developing their QAFAs and USAs, they directed their focus toward wing level organizations, the same focus as that for the new Secretary of the Air Force (SECAF) Unit Quality Award. Air Combat Command (ACC), however, decided to deploy these assessments at squadron level, as well as to the aggregate (wing and group) levels. By recognizing the squadron as ACC's primary unit of output, we expect to accelerate the assimilation of quality principles into our culture and identify more and better opportunities to improve our processes.

This paper highlights ACC's squadron-level focus, the QAFA/USA connection, and USA guidance and training.

INTRODUCTION:

In May 1992, the Air Force Quality Council adopted a "blued" version of the Malcolm Baldrige National Quality Award criteria as the basis for its new SECAF Quality Award. The new QAFC comprise seven major criteria categories, or indices, for assessing an organization's customer focus and operational performance. Subsequently, the Chief of Staff of the Air Force (CSAF) replaced the AF's old Unit Effectiveness Inspection with a new QAFA. Although not required by CSAF, many of the MAJCOMs began implementing their new QAFA with QAFC as the basis; some of these MAJCOMs also replaced their old unit self inspection systems with a new USA modeled after their QAFA.

Since the QAFC was intended generally to assess and recognize quality achievements at wing-(and some group-) level organizations, the MAJCOMs incorporating QAFC into their assessments also developed them for application at the same level(s). Each of those MAJCOMs, except ACC, continues to focus their QAFAs and USAs at wing- or group-level organizations. General John M. (Mike) Loh, Commander ACC (COMACC), determined that focusing these assessments toward our primary unit of output will better reflect and deploy ACC's style of quality and leadership, as well as produce better results -- and, for ACC, the primary unit of output is the squadron.

Recognizing that the QAFC framework is new to most of us, and understanding that fears and uncertainties generally accompany any change in culture, General Loh provided ACC units with a variety of information, training, and assessment aids. These aids range from literature and videotapes on ACC Style Quality, guides for ACC assessments and USA training, to "road shows" familiarizing units with the new criteria and teaching them how to conduct a USA. In a major attempt to launch the command into our quality culture, COMACC announced, during the Fall 1993 Commanders Conference, that all active ACC units would complete their initial USA by 1 October 1994. This initiative has clearly motivated our unit's efforts to set that "first stake" from which we can begin measuring our forward progress, and it helped propel our units past their natural reluctance to begin new journeys.

The remainder of this paper highlights ACC's "style," squadron-level focus, the QAFA/USA connection, and USA guidance and training.

ACC STYLE QUALITY:

"ACC QUALITY IS A LEADERSHIP COMMITMENT TO AN OPERATING STYLE WHICH CREATES A WORKING CLIMATE THAT PROMOTES TRUST, TEAMWORK, AND A QUEST FOR CONTINUOUS IMPROVEMENT IN ALL THAT WE DO. IT INVOLVES DEVELOPING A PASSION FOR CUSTOMER SATISFACTION, WITH AN OBSESSION FOR PRODUCT QUALITY AND A COMMITMENT TO CONTINUOUS, MEASURABLE IMPROVEMENT."

- GENERAL LOH

Figure 1

ACC employs a holistic approach to quality, a blend of quality philosophies, to promote all of the AF quality concepts and principles, yet meet the needs and expectations of ACC and its people. A description of ACC Quality (Figure 1), as well as the fundamentals (Figure 2) and precepts (Figure 3) of ACC style are posted on our walls, listed in our publications, voiced by our leaders, adopted by our people, and shared with our communities. Together, they give us a sense of purpose, direction, accomplishment, and self worth.

ACC STYLE

FUNDAMENTALS

- DECENTRALIZATION
- EMPOWERMENT & OWNERSHIP
- MEASUREMENT
- TRAINING
- LEADERSHIP

Figure 2

ACC STYLE

PRECEPTS

- CREATE A CLIMATE OF TRUST, TEAMWORK, QUALITY, AND PRIDE.
- GIVE EVERYONE A STAKE IN THE MISSION AND ITS OUTCOME.
- DELEGATE AUTHORITY AND RESPONSIBILITY. ACCEPT ACCOUNTABILITY.
- SET GOALS. MEASURE PROGRESS. REWARD PERFORMANCE.
- DELIVER QUALITY PRODUCTS TO ALL CUSTOMERS.
- STRIVE FOR A CULTURE OF CONTINUOUS IMPROVEMENT. MAKE IT BETTER.

Figure 3

SQUADRON FOCUS:

In ACC, we recognize the squadron as our primary unit of output (product or service.) This premise lies at the heart of our operating style and it is central to our system of assessments. While we fully acknowledge that wing- and group-level organizations add synergy to and may actually deliver our products or services to their ultimate customers, it remains clear to us that the squadron is the unit producing the output.

This focus on and assessment of squadron activities, within the QAFC framework, enables our leaders to transcend from mere espousal of quality principles to actual deployment of them. Having formally declared our command policy to assess and report on squadron processes and activities, using the same criteria as used for wing or group activities, ACC effectively commits itself to the operating style it promotes.

We expect to derive two very significant benefits from our focus on the squadron. First, by becoming a focus for attention and assessment, we anticipate unit personnel will learn, understand, implement, and reap the rewards of our quality style more quickly than by retaining the focus at the aggregate (wing and group) levels. This will clearly accelerate our assimilation of ACC Style Quality throughout all levels of our organizations. Secondly, we expect to identify many significant opportunities for improvement through our multi-level, quality-focused, fact-based assessments. Our findings will provide many new opportunities for us to develop, practice, and apply cross-functional analysis and process-improvement skills at each organizational level.

THE QAFA/USA CONNECTION:

In ACC, both the QAFA and the USA assess unit processes and activities (wing, group, and squadron) using the QAFC. The QAFA is conducted by an Inspector General team every three or four years while the USA is conducted by a unit's own personnel every year. The ACC/IG thoroughly reviews each unit's USA report prior to the QAFA, in order to better prepare for the assessment and to identify areas needing specialized training or assistance.

USA GUIDANCE AND TRAINING:

Embodied in the decision to change the quality culture in ACC, adapt the QAFC to our assessments, and focus on the squadron as the primary unit of output, General Loh and his senior leaders planned the development and implementation of a variety of references, resources, and guidance to help our units understand and adjust to these enormous changes. They include pamphlets, videotapes, and speeches explaining and promoting our new direction. In addition, ACC Assessment Guides (AG), a USA Training Guide, and a USA Training Course have been developed and deployed; together they provide the wherewithal for understanding/applying the criteria and preparing for/conducting the USA.

ACC Assessment Guides

From December 1992 through June 1993, a cross-functional team from across the entire ACC headquarters staff researched all applicable inspection guidance (including that from the former SAC and TAC), studied the new QAFC, then developed and published a set of 20 ACC AGs. One is tailored to headquarters assessments, another to wing-/group-level assessments, and the remaining 18 to the majority of our functional squadrons (Figure 4).

ACC ASSESSMENT GUIDES

- 20 GUIDES
 - HQs (1)
 - WG/GP (1)
 - SQUADRONS (18)
- ACC CROSS-FUNCTIONAL EFFORT
- CORE QUESTIONS (QAFA FOUNDATION)
- GENERIC MODULES
 - SAFETY, ADMINISTRATION, ETC.
- COMPLIANCE WHEN REQUIRED

Figure 4

The primary purpose of this effort was to provide each of our functional units with a single, understandable, and easy-to-read document blending QAFC principles and key compliance (customer) requirements. Three milestones were established to achieve this purpose: 1) make the QAFC language more understandable and less "business" oriented, 2) incorporate only the

essential compliance requirements from the former self inspection checklists into QAFC-style, process-oriented questions, and 3) provide examples to help units relate to the new criteria.

The initial AGs were published in June 1993. The AGs contained a set of "core" QAFC-type questions, some functional-module questions (e.g., safety, administration, orderly room, resource advisor, mobility, etc.) generic to all organizations, and a collection of compliance-specific questions (nearly 2100 pages of the old self-inspection checklists were reduced to just over 1100 pages of process questions spread over the 18 squadron AGs). Recently the AGs have undergone a major revision refocusing the questions more toward overall processes and less on specific compliance. The new AGs still contain the core questions and now include examples for many of the questions but have eliminated the functional module questions and all compliance questions, except those mandated by appropriate public laws and higher headquarters directive.

USA Training Guide

During July and August 1993, a team composed of ACC Inspector General (IG) and Quality Center (QI) personnel were sent to Minot AFB, North Dakota, to help the 5th Bomb Wing develop and submit its nomination for the new SECAF Unit Quality Award. A second, parallel purpose for the visit was to develop a prototype for the USA process (squadron-, group-, and wing-level). From this combined effort, a six-step USA process was developed, refined, and later published in November 1993. Essentials of the six-step process are highlighted as follows.

Step 1 - Objectives, Roles, and Responsibilities summarize the general planning that must be determined and communicated to all organizational members. During this phase, timing for the conduct of the USA should be determined, taking into consideration all barriers (fears, lack of training, etc.) and constraints (exercises, deployments, etc.) that need to be overcome. At this point, a team structure (number and size) should be developed and the members selected. We recommend a team structure similar to Figure 5, with a minimum of four to eight personnel per team; collectively, they should be reasonably familiar with all major unit processes and activities.

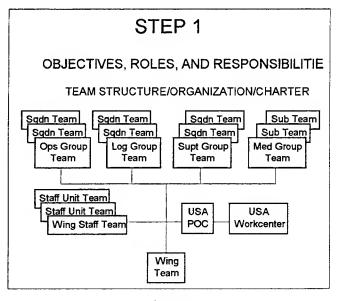


Figure 5

Step 2 - Pre-Assessment Actions involve identifying, gathering, and consolidating essential elements of information (Figure 6), many of which are readily available, into a handy package for use in preparing for and conducting the USA. These elements include vision and mission statements (as well as the unit's strategic quality plan), future factors to be considered (downsizing, added missions, etc.) and special relationships/constraints (community considerations, climate factors, etc.), and an identification of the

unit's COPIS Focus relationships.

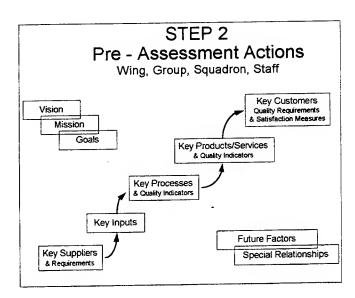


Figure 6

While at Minot AFB, the combined IG/QI team enhanced the five-step COPIS (an existing quality tool to help identify a unit's customers, outputs, processes, inputs, and suppliers) with a measurable "Focus" by adding five additional steps to highlight indicators or methods of measuring the quality of the primary elements, and to identify the key data systems that might contain indicator information. Even if a USA is not going to be conducted, a ten-step COPIS Focus exercise provides an enormous and powerful tool for educating unit personnel about the mission of their organization and how they contribute to that mission.

Gathering and communicating pre-assessment information, relevant to each separate organizational level being assessed, helps both assessor and assessee focus more clearly on the QAFC questions.

Step 3 - Assessment Training for all unit personnel should consist of, at least, basic awareness training and QAFC familiarization. Figure 7 reflects the minimum amount of training recommended for unit assessors. Any additional and peripheral quality training made available will enhance significantly the USA process for both the assessors and unit personnel.

STEP 3

ASSESSMENT TRAINING

- QUALITY AIR FORCE CRITERIA
- CASE STUDY SCORING EXERCISE
- ACC ASSESSMENT GUIDE USAGE
- UNIT SELF ASSESSMENT PROCESS TRAINING

Figure 7

Step 4 - Assessment Execution

Planning is the final and most detailed planning phase for the conduct of the USA. The degree of success achieved by the USA rests largely with the amount of detailed planning and choreography incorporated into this phase. Details should include specific responsibilities, timelines, meeting schedules, information collection and validation methods. information sharing, and workcenter support (Figure 8.) Assessors must fully develop an understanding of the criteria, know who/how/when they will interview, how/where to validate responses, then plan to communicate findings/achieve consensus on unit scores.

STEP 4

ASSESSMENT EXECUTION PLANNING

- ASSESSOR RESPONSIBILITIES
 - TECHNIQUES FOR ASSESSMENT, INTERVIEWS, VALIDATION, ETC
- ASSESSMENT TIMELINE
 - RECOMMEND 2 WEEKS
- COMMUNICATION
 - DAILY MEETINGS AND FEEDBACK
- WORKCENTER SUPPORT
 - ASSESSMENT CONTROL AND TYPING SUPPORT

Figure 8

Step 5 - Assessment Execution is the collection, validation, scoring, and reporting phase of the USA (Figure 9). It involves completing the squadron assessments, shifting focus and attention to the aggregate assessment summaries (group then wing), and publishing the overall report.

STEP 5

ASSESSMENT EXECUTION

- ASSESS AND SCORE SQUADRONS AND WING STAFF AGENCIES
- ASSESS AND SCORE GROUPS
- ASSESS AND SCORE WING
 - CONSENSUS ASSESSMENTS ATALL LEVELS
 - WRITTEN INPUTS AT ALL ORGANIZATIONAL LEVELS
- WRITE REPORT

Figure 9.

The final report should contain a wing-level summary identifying the wing's COPIS Focus, strengths and opportunities for improvement (aggregated to category level - 1.0, 2.0, etc.), and the group level summaries. Group-level summaries should also contain a COPIS Focus, strengths and opportunities for improvement (also aggregated to the category level), and the squadron-level assessments. Squadron assessments should contain a COPIS Focus, as well as its strengths and opportunities for improvement (aggregated to the item level - 1.2, 4.3, etc.)

Scores will be assigned to each level assessed (all items and categories for squadrons, categories only for groups and wings) and will be published either with the report or forwarded to ACC/IG separately.

Step 6 - Assessment Follow-Up is the key to the continuous improvement cycle (Figure 10). The USA report should identify the unit's strong points, as well as those areas (process, measurement, guidance/direction, communication, and customer focus) in which leadership attention needs to be concentrated. It also should identify opportunities for creating and improving unit effectiveness and efficiency. During follow-up, key decision makers should review/analyze the report findings (at each level assessed), prioritize and align unit efforts, incorporate their decisions into the strategic planning process, then commit resources to the pursuit of continuous improvement.

STEP 6

ASSESSMENT FOLLOW-UP

- USA NOT COMPLETED UNTIL FINDINGS INCORPORATED THROUGH ORGANIZATION'S STRATEGIC PLAN
- ANALYZE RESULTS PLAN TO HOLD GAINS AND CLOSE GAPS
- PROVIDE FEEDBACK & CROSSTELL

Figure 10

Unit Self Assessment Training Course

After General Loh announced that ACC units would complete a USA by 1 October 1994, the ACC Inspector General, stated he would prepare a training program to help units through their first USA. As a result of this initiative, the IG's new Programs and Training Branch (IGPT) was given an additional charter to create and deploy a training course, in cooperation with QI, to meet ACC unit's USA training needs.

Using a quality-centered process, the IG/QI team identified customers, surveyed their needs/desires, reviewed current capabilities, reviewed other/similar courses, then developed and tested a prototype USA Training Course. After further development incorporating unit feedback, the course (Figure 11) was put "on the road" 12 January 1994. The course is continually incorporating new materials, exercises, and example applications as they become available. Unit comments and feedback surveys continue to rate the course "very high" in presentation, content, and applicability.

USA FIELD TRAINING

WHAT?

- THREE DAY AF QUALITY CRITERIA / USA COURSE
- CONDUCTED AT UNIT REQUEST AND EXPENSE
- BENCHMARKED AFQI, ANG, AT&T
- WHY?
- "WE'RE HERE TO HELP!"
- · ASSIST CUSTOMERS PREPARING TO SELF-ASSESS
- EXPAND ACC UNDERSTANDING OF USA PROCESS
- TRAINING PRESENTED ON 7 CATEGORIES
 EXAMPLES PROVIDED FOR 28 ITEM AREAS
- (HOW?)
- · CASE STUDY EXERCISES CONDUCTED
- SIX STEP USA PROCESS EXPLAINED
- · TEAMS OF 3 INSTRUCTORS EACH

Figure 11

An executive overview of the course is also available to unit leadership. During the overview, instructors summarize overall course content, point out general student concerns, stress the leadership role, and address unit questions.

SUMMARY:

Air Combat Command has fully accepted the principles and concepts of the Quality Air Force framework and has taken a giant step forward in furthering the assimilation of that framework, and its criteria, into the ACC Quality Culture. By recognizing the squadron as our primary unit of output, focusing our assessments at that level, and redirecting leadership attention and training emphasis, we are confident we have unleashed all the major elements of the "ACC Style" of quality.

As a result of this effort, we expect to see an early quality acculturation at all levels and anticipate substantial benefits in quality improvement.

WORKS CONSULTED:

Forging the Future, Air Combat Command, 1993.

General John M. Loh, Speech to Hampton Roads Quality Council, 1 October 1992.

Mark Graham Brown, <u>Baldrige Award Winning Quality</u>, Fourth Edition: How To Interpret The Malcolm Baldrige Criteria, ASOC Quality Press, 1994.

Quality, Air Combat Command, undated.

Quality AF Criteria, United States Air Force, 1993.

The Quality Approach, Air Force Quality Center, Fall 1993.

Unit Self Assessment Course, Lesson Plan, Air Combat Command, April 1994.

Unit Self Assessment Training Guide, Air Combat Command, 1 November 1993.

1993 Stakeholders Report, Air Combat Command, 31 December 1993.

What Does 'Systems Perspective' Mean or You Get What You Measure, You Get More of What You Reward!



MSgt Jerrold Strong

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WHAT DOES 'SYSTEMS PERSPECTIVE' MEAN

or

YOU GET WHAT YOU MEASURE, YOU GET MORE OF WHAT YOU REWARD!

by Jerrold Strong 60th Air Mobility Wing

ABSTRACT

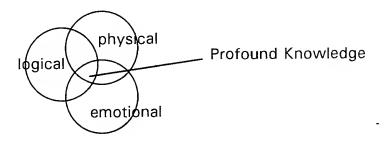
Air Force leaders must have a basic knowledge to practice quality. W. Edwards Deming called it "Profound Knowledge." Profound Knowledge is developed through an appreciation of four concepts: Variation, Theory of Knowledge, Psychology, and the Theory of Systems. Deming operated with a basic assumption that management is necessary in business. Management establishes the aim of the business. With process measures, solid predictions of performance of business processes can be made so that customer requirements can be met based on knowledge. Air Force leaders need to learn and develop an appreciation for Profound Knowledge to control and reduce variation, predict performances based on data, provide operational definitions for effective communication throughout the organization, and use individual differences to build high performing teams, as well as encourage innovation and build intrinsic motivation. To neglect any element affects the whole. To become Quality Air Force requires transformation. It will begin when leaders have Profound Knowledge.

INTRODUCTION

When I first got involved in quality, I volunteered to teach the (then) Military Airlift Command Leaders (quality awareness) Course. I didn't have a clue about Total Quality Management (TQM). But as I strove to become competent in this new approach to work, I became more and more aware of what Dr. Myron Tribus said, "The Japanese saw that we (Americans) had all the bits and pieces. But no one understood the power of it (TQM as a system) . . . and they began to teach it as a system" (Dobbins). So much of what I was learning, as I read books, attended seminars, watched videos, joined professional associations and networked with other quality professionals, seemed to ring true. However, I couldn't put my finger on what was missing until I attended a Future Search Conference. In the process of the conference a subject area surfaced that intrigued me, but no one appeared to have a real good grip on the subject. The subject was what W. Edwards Deming called Profound Knowledge. Some books were recommended to me, like Out of the Crisis by Deming, Deming's Road to Continual Improvement by Scherkenbach or some work by Fritjof Capra. I began reading. I became a team leader for the Sacramento Area Council for Total Quality (SACTQ) Profound Knowledge Team. We explored what this cosmic title meant. It was as if a light bulb turned on. Deming was right, profound knowledge comes from the outside (Deming, 94).

I want to discuss in this paper how this philosophy applies to what I have experienced in the last 20 years in the Air Force. I will approach it in a similar way Scherkenbach did in his

aforementioned book. He used a Venn diagram to illustrate the theory of change (Scherkenbach, 88). Three overlapping circles illustrating the primary aspects of life, the physical, logical and emotional. Profound Knowledge lay in the center where all three circles overlap, as shown below.



In Deming's discussion of Profound Knowledge, he operated on a basic assumption. Management (Leadership) is required in organizations, and there is a basic knowledge they must have for them to fulfill their role in their organizations. "There is no substitute for knowledge" (Deming, 2). This basic knowledge is developed through an appreciation of four concepts that are interdependent: Variation, Theory of Knowledge, Psychology, and the Theory of Systems.

PHYSICAL -- An Appreciation for Variation

Leaders and managers must have knowledge of variation in the physical realm of work. Variation exists. Variation exists, between people. No two people are alike. In fact, no one person is the same on different days. Variation exists between people and equipment, people and material, in the tools we use on equipment, within the tools we use. Every thing, every process and activity, experiences variation. How do we capture, understand, and make good management decisions based on our knowledge of process variation?

I discovered, in my experience in three different specialties, overseas and stateside, accompanied and not, Air Force organizations measure a lot of stuff. Typically, we seek whom to blame if the numbers drop, or whom to make responsible for making sure the numbers get better. Immediately! We prepare for inspection, rather than being looked at in how we do our daily activities. Our inspection systems have fostered fake measures. Many of our inspections are of fantasy, not reality. Improvement is very short term (the length of the inspection), then we go back to business as usual. What gets measured gets done.

Our work processes have many variables outside of the control of the worker, yet the worker is typically blamed for poor results. Fear of reprisal, failure and providing information keeps effective communication about causes of the variation from taking place. How much control does anyone have in how long it takes to get to work in the morning? Traffic, signals, road conditions, car conditions, weather conditions, a bad hair day, all kinds of things contribute to variation in our most mundane processes. Do we know and understand all the things that contribute to variation in our organizational processes? How do we measure process performance? Do we know the process flow? How can we measure what we don't know? How can we manage what we don't measure? If you can't measure something, you can't understand it. If you can't understand it, you can't control it. If you can't control it, you can't improve it. (Harrington, 43) We must learn and practice our understanding in the work place.

We must measure what's important as the process is working, then be careful not to treat the normal variation of our process(es) as something special. Every dip or peak in performance

may be nothing more than normal variation. To react to every dip and try to fix it only tampers with the process, may make process performance worse, but at the very least, will frustrate and rob organizational members from enjoying their work. If we aren't satisfied with the amount of variation in a process, or if the average performance isn't what the customer is satisfied with, then we must change the process. How many of us have tried different routes to work to find the one with the fewest uncontrollable variables -- process improvement. We must change the way we do processes to change their variation or average performance. And, oh, by the way, adding resources, throwing people, equipment or money at it, doesn't change the process. Changing the number of steps, where to use technology, arrangement of tasks, or where decisions are made, changes processes. Leaders and managers should, also, not treat special cause variation as normal variation. Easy and quick successes are achieved if we identify the rare occurrence that is accidental, or not normal, and prevent it, if possible, from happening again. Let the voice of the process, good statistical measures of performance over time, determine when to find a better way to satisfy our customers, internally as well as externally.

LOGICAL -- The Theory of Knowledge

Management is prediction (Deming, 104). Data should be used to make sound decisions. "In God we trust, all others must have data." Again, Air Force organizations measure a lot of stuff. How much of it is used to explain the past or predict the future in any comprehensive way? How much of our data helps us manage our journey towards our vision? How much time is wasted by those who collect data, assemble it, package it, briefly present it, and file it, only to dispose of it in a year or whenever the filing plan dictates? The rework and effort for non-value added wordsmithing, formatting, 'beefing it up,' and all the other reasons for unnecessary work, boggle the mind. All that work and the product may only be scanned once in a staff meeting, then filed and forgotten. Waste and rework accounts for up to thirty-five percent of the cost of doing business in the private sector for white collar workers (Harrington, 45). And they are trying to make a profit! How much is lost to waste and rework in the military, in the Air Force, at our wings, in our offices? You get what you measure.

Leaders must identify what is really important to know and let the rest go. We can't afford the dog and pony shows of the past. The human resource is too valuable. Money is getting harder to come by. If the data doesn't help us explain the past or predict the future in the context of continuous improvement and customer satisfaction, we are wasting our, and our people's, time. Time is the only non-renewable resource and the key strategic variable in how we plan and do work for the customer.

Leaders must have knowledge about the production of chaos and loss from things like worker training worker. What kinds of successive errors are developed in the work place? Is this how skill qualification and upgrade training is accomplished? What approach is used to develop leaders who will follow in our steps when we leave? Is there a systematic method using experts to develop and do the training? How are quality concepts integrated into that systematic method? On-the-Job training, in my experience as well as many others I've talked to, has not been structured, but catch as catch can. There's no time for formal training! No time to develop experts -- we have a job to do. Leaders must look further ahead, perhaps sacrificing some short term successes for long term gains.

Leaders must also understand that best practices in other organizations may not work in their area. Examples without understanding why they work teaches nothing. A big failure we can have in our business is to copy a process of a world class organization without understanding why it works for them, and apply that process to our own organization. Change occurs but performance does not increase, or may get worse, and management is left confused and frustrated. Leaders are at a loss as to why.

Leaders must understand what Tom Peters has said, that perception is all there is. Every one sees the world in his/her own peculiar, erratic, distorted, filtered way. Joel Barker explored this issue well in his video, "Discovering the Future -- The Business of Paradigms." Selective listening, seeing, perceiving happens. Different psychological assessments reveal basically the same thing, whether dealing with adult learning styles, or personality types, we all see, hear, taste, smell, and feel the world differently. This is evident when police try to gather witness statements about an accident or crime. We must develop an appreciation for that diversity and discover how to use those differences to make better decisions about the future.

Operational definitions must be established for effective communication to take place. Every organization, private or public, suffers from the lack of operational definitions. Assumptions are made that everyone knows what a certain word means, yet very few know the same thing at all. I ask the question in most of the classes I teach, "What does integrity mean?" I rarely get answers, and when they are provided, hesitantly, they aren't accurate. What does professional mean? I had a commander step in my office and comment that I needed to clean up my office, it didn't look professional. Is that what professional means? My office looks professional if my desk is clear, things are stored out of sight, the office is neat and tidy, while I am trying to get work done? What does ASAP mean? It means different things to different people!

It is really important for leaders to be clear when they try to communicate organizational values to the work floor. But probably more important is when leaders attempt to practice those values in decision making. The operational definition of any command, policy, procedure, or request is not what you intended, but what the process actually gave you (Scherkenbach, 216). If there isn't a common understanding of terms -- confusion, misinterpretation, and bad decisions result.

EMOTIONAL -- An Appreciation for Psychology

People are different. Management of industry, education and government operates today under the supposition that all people are alike (Deming, 111). They are not. Carl Jung, a Swissborn psychologist in the early '20s, concluded that human behavior wasn't random. It seemed consistent in two areas, perception and judgment, although the ranges of behaviors in those areas were infinite. Katherine Briggs and Isabel Briggs-Myers developed an indicator to validate Jung's theory, the Myers-Briggs Type Indicator (MBTI). It is one of the most widely accepted, reliable and valid personality preference indicators currently available (Kroeger). The MBTI explores how we are different in the way we perceive and make judgments about the world, how the world sees us, our public face, and how we are energized, either internally or externally (in very simple terms). The behavior of that one person you work with, or a couple of peers, a subordinate or superior, that has irritated you in the past becomes interesting, and maybe even entertaining. The problem is that we don't understand or account for those differences. We assume that everyone

sees and understands the world the same way we do, and if not, they are penalized. How? Poor performance reports, no opportunities to advance in the job area, or the individual is seen as a barrier to getting the job done and administrative action may result. What is important, is that we learn, together, to understand the preferences of each other so that the organizational team can perform better. MBTI is one of many psychological tools that can be used to illustrate and understand individual differences, and help build high performing teams and organizations.

Leaders must know the difference between intrinsic and extrinsic motivation. Our system rarely accounts for those differences in people. A correlation can be drawn between Maslow's Hierarchy of Needs and Herzberg's theory of maintenance and motivating factors. Herzberg's maintenance factors are important to those of us that are dominantly on the bottom three levels of Maslow's hierarchy and the motivation factors for those of us on the top two levels. The Air Force structure does little to account for individual differences in these areas. Enlisted members start at the bottom and are treated as maintenance seekers. Some are not. When E-7 is achieved, however, an artificial barrier is crossed into the realm familiar to officers. We are treated as motivation seekers. Self-esteem needs become the rule of the day. Privileged information, restricted access to certain areas on a base, 'rank has its privileges,' all are very much a part of our proud tradition. We have an artificial barrier, a social distance set between our structured classes of maintenance seekers and motivation seekers. Junior enlisted members may or may not be maintenance seekers. Some may be motivation seekers. Officers are not the only ones with college degrees, or some arbitrary level of maturity. Stephen Covey says that most people have a basic desire to live, to love, to learn, and to leave a legacy.

I recently facilitated a Team Workshop in a wing unit that is considered by almost everybody to be the paradigm of good teamwork, and yet, internally, conflict and unresolved issues were reaching critical mass. No time to spend on the human organization, we've got a job to do! "Tough it out," was the counsel. Task focus, no patience with root cause analysis, treat the symptoms and press on! You get what you measure. When will leaders realize that the mission isn't mechanical or technical. It is social. It is people who do the work. Equipment and technology are tools people use. You manage things; you lead people! People are born with a need for relationships with others, and with the need to be loved and esteemed. There is an innate need for self-esteem and respect. Circumstances provide some people with dignity and self-esteem. Circumstances deny other people these advantages. Leaders and managers who deny their members' dignity and self-esteem will smother intrinsic motivation. We are born with a natural inclination to learn and to be innovative. Under extrinsic motivation, learning and joy in learning in school is submerged in order to capture top grades. On the job, joy in work, and innovation, become secondary to a good rating. We are ruled by external forces. We try to protect what we have. We try to avoid punishment (Deming, Feb. '90). How do leaders expect to build high performing teams in the work place without dealing with these concerns? If you want to know how well quality has become a part of organizational culture, look first at the reward and recognition system. We get what we measure, but we will get more of what we reward! How well does leadership build the intrinsic motivation of it's people? How well do we reward and recognize our people for innovation, improvement for the customer, cooperation and teamwork without over justification? If we fail to invest in the human organization, we will never, never, never, see real customer focus and continuous improvements for the customers benefit as a natural part of our culture.

APPRECIATION FOR A SYSTEM

Life is a system. There are no independent structures. The previous areas discussed cannot be separated. They are highly interdependent. The Emotional area is incomplete without knowledge of variation in the Physical area. It is knowledge of variation in the Physical that allows prediction in the Logical. The Logical area helps us understand that management in any form is prediction: that grades in school are predictions of performance; that performance appraisals of members are predictions. The poet John Donne once said that no man is an island, but a part of the main. The poet was right. We are interdependent in a very big system.

St. Paul understood a system. Exerpts from 1 Corinthians 12:8.

A body is not one single organ, but many. Suppose that the foot should say, "Because I am not a hand, I do not belong to the body," it does belong to the body nonetheless. Suppose that the ear were to say, "Because I am not an eye, I do not belong to the body," it does still belong to the body. If the body were all eye, how could it hear? If the body were all ear, how could it smell? . . . there are many different organs, but one body. The eye can not say to the hand, "I do not need you." (Deming, 67)

A system must have an aim. Without an aim, there is no system. The aim of the system must be clear to everyone in the system. A system must be managed. It will not manage itself. (Deming, 51)

What's important here is that our organizations are systems. There is interdependence among the components. The Air Force Quality Institute has said that leaders must have a systems perspective (AFQI, I-2). What does that mean? The lowest level of Air Force organization designed to be relatively independent is the wing. For that reason, Quality Air Force Assessments (QAFA) initially targeted at wings seemed appropriate. Groups, squadrons, flights and so on are highly dependent on the larger organization, the wing. Here is the beginning of having a systems perspective. Wings are a part of greater systems that can be defined at higher levels.

Leaders at all levels must seek to optimize the system as defined. A cautionary note must be made here. Components of the system should not seek to optimize themselves. Suboptimization is detrimental to the system as a whole. Components of the system must seek winwin and not compete. Competition is a zero sum game within the system. If we have a winner, we have a loser. How has that helped to optimize the system? Organizational teams succeed only if they cooperate and practice win-win within. Leaders must seek to optimize the system, at wing level, command, Air Force, and DOD.

Leaders must appreciate the interdependencies of the physical, logical and emotional components of the system. Their guidance and support must nurture the aim of the system with knowledge of variation in the physical, use of data and operational definitions for effective communication and prediction in the logical, and development of the social organization in the emotional.

Leaders must have this basic knowledge for quality to no longer be a "buzz word," but become a part of our culture. Only then will the Air Force be able to make the quality transformation to Quality Air Force!

Works Cited

Air Force Quality Institute, The Quality Approach, United States Air Force, Fall 1993.

Deming, W. Edwards, The New Economics, MIT -- CAES, Cambridge, MA, 1993.

---. "A System of Profound Knowledge." Paper written 3 February 1990.

Kroeger, Otto, Type Talk At Work, Dell Publishing, New York, 1992, pg. 6.

Quality . . . Or Else! Narr. Loyd Dobbins. Prod. Clare Crawford-Mason. PBS Special. KQED, San Francisco. Mar 92.

Scherkenbach, William, <u>Deming's Road to Continual Improvement</u>, SPC Press, Knoxville, TN, 1991.

PART VI

Other Quality Issues

Hit the Ground Running



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Hit the Ground Running

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Abstract

Technology, automation, and hardware updates are quickly changing our business world. In order to keep pace with the changes, workers need to be flexible, adaptable and quick learners. Interpersonal skills are constantly in use. In a recent survey conducted by Murray State University, employers of manufacturing engineering technologists cited five critical entry-level tasks expected to be performed by new graduates in the year 2000. These "top five" criteria reflect a need for new hires to be quality-minded, creative thinkers, self-starters and team players with a solid technical background. The challenge facing universities then is: how to best prepare graduates to meet the current industrial expectations.

Organizations currently spend a great deal of time and money "retraining" their existing work force so that they can perform at a level consistant with that expected of newly hired university graduates. If the new graduates are hired based on their ability to meet employers expectations, they would not require retraining and would be able to "hit the ground running". If America is to change the way it does business, it is imperative that new graduates are adequately prepared to enter the job market and that employers carefully select candidates that fully meet their expectations. One way for employers to achieve this goal is to use a consistant screening process for quality attributes during the initial interviews.

Introduction

Many organizations have reached the conclusion that "the future ain't what it used to be"². In order to be competitive in today's markets, organizations must be quality oriented, customer focused and data driven. In a recent survey conducted by Murray State University, employers of manufacturing engineering technologists cited the following "top five" critical entry-level tasks expected to be performed by new graduates in the year 2000.¹

- 1. Understand the importance of quality the importance of doing it right the first time.
- 2. Display a work ethic that displays motivation, natural curiosity, and a sense of responsiveness without close supervision.
- 3. Have the ability to speak effectively and communicate both orally and written in a clear, concise, and professional manner.
- 4. Work in a "team" environment that requires compromising for the "good of the whole".
- 5. Improve existing methods, processes, and materials; evaluate emerging technologies for implementation.

Employees must be quality-minded, creative thinkers, self-starters, and team players.

Companies spend millions of dollars each year training their existing work forces on the above topics, but generally fail to realize the importance of selecting (through the interview process) new hires with these attributes. An organization could decrease retraining costs and become more competitively positioned if all new hires were selected to meet the criteria listed above. A change in old work habits of more experienced workers could be facilitated if new hires already display many of the important attributes that are desired. The question that remains is how to best select new hires that can display these critical work habits.

Initial Interview

We are not believers in the adage "you can't teach an old dog new tricks" but if a puppy already displays some of the new tricks, then training will be easier, learning curve time will be decreased, your success rate will increase, and old dogs do learn from the new pups! The best way to determine if a new hire displays any of the desired attributes is through the initial interview. Prior to interviewing, a quality checksheet could be developed for use in the first interview. The checksheet would simplify and objectify the interviewing process. It could reference attributes, and should refer to specific questions to be asked of all candidates during the first interview. The checksheet would be very helpful when evaluating candidates who may have had different interviewers. The process of developing the checksheet allows for discussion and eventual consensus within your organization as to the "critical" attributes a new hire should possess.

Of course, the interviewer must not only be familiar with technical aspects of the job, but must also be familiar with various quality topics so they are able to discern a difference between candidates. The interviewer must ask probing questions as well as carry on a conversation about various quality topics and the way the quality movement has affected the job of interest. An interviewer should not be satisfied with a single positive remark concerning the quality movement during the interview. A candidate should be evaluated on the depth of their knowledge, practical experience with the subject (classroom or industrial) and display an ability to implement their knowledge.

Questions should be specific, yet open-ended. Find out if the candidate knows about the quality movement. Ask the following questions; did the candidate enroll in a course on quality? Was this course a technical elective or a required course? How did the candidate feel about the relevancy of the course in the work place? What topics were discussed in the course? Elaborate on ISO 9000 or Quality Function Deployment or Strategic Quality Planning. Ask if the candidate has any industrial work experience in the quality field, and if so, doing what?

Another interviewing technique which is quite helpful when evaluating candidates is to describe a scenario and ask the candidate what action they would take. For example, a hydraulic tube is found to be outside of the wall thickness specification limits, yet it is needed in assembly that afternoon. The candidate is asked what action they would take to resolve the problem. You are able to evaluate a number of attributes based on their responses; such as, attitude towards quality and meeting production schedules, attitude toward working with various people such as the quality inspector who discovers the problem, assembly personal and suppliers.

Evaluating nebulous characteristics such as work ethic, motivation, natural curiosity, listening and time management skills is more difficult. Ask the candidate to describe their typical study time to try and determine their use of time management skills. (Do they begin studying at 7:30 p.m. and end at 8:30 p.m. or do they begin studying at 6:30 p.m. and

end at 11:00 p.m.?) Ask if they held a job during the semester or summer months. Ask them to describe their duties as a way to investigate work ethic and motivation. Ask how many credits they carried during the semester, and how many hours of outside classroom study did they average? The answer should help you understand their motivation and also use of time management skills.³

Oral communication can be evaluated during the initial interview. Remember to ask the candidate about their experience with formal, oral presentations. Ask them what kinds of presentations they have made, in what context (team or individual) and what they feel are the "secrets" to a successful presentation. Watch for eye contact, correct use of grammar and the ability to communicate ideas in a clear, concise fashion. Questions should also be directed at written communication skills. Ask the candidate about technical writing classes or courses requiring written reports. Find out if the reports were graded on content alone, or included grading on grammar and spelling. Most students do not appreciate the importance of communication skills. Remember, the best technically prepared engineer or technologist must be able to communicate his/her ideas with others. It is important to select a candidate who displays balanced strengths.

Another area to evaluate is the candidate's ability to work with others in a team setting. Synergy is one of the most important benefits of teamwork. It is crucial that new hires understand the importance of teamwork and how a team functions. Most graduates dislike team projects because of the time required and grading policies associated with teamwork, yet many graduates have worked in teams. It is important to discern differences in "team players". Ask questions concerning any team assignments, whether it was short term (one week) or long term (semester). Find out how the work was accomplished, who was the leader, how communication took place, how were disputes handled? If the candidate was a member of a team where a fellow team member did not perform well, ask how this problem was resolved. Find out if the team "made up" for the poor performer, confronted the person or spoke with the instructor. From the responses, it should become evident who would be an acceptable addition to your team.

Evaluating the technical knowledge of the candidate must not be forgotten. This evaluation is generally considered easy because it is usually based on facts, i.e., a candidate must have successfully completed a Fluid Dynamics course. When developing the quality checksheet, it would be appropriate for an organization to discuss the technical knowledge that each new graduate must possess. Generally, the outcome of such a discussion is a laundry list of coursework and other relevant experience required for the position. This list then becomes part of the quality checksheet.

Outcome

New hires should be able to hit the ground running when it comes to quality. They should display a positive attitude towards teamwork, possess a burning desire for continuous improvement and approach tasks with the attitude of doing it right the first time. Use of the quality checksheet can help employers select new hires to meet the above objectives. Eventually the work force will display new attitudes towards the importance of quality.

References

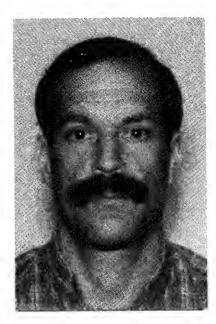
- 1. Zirbel, Jay H, "Manufacturing Engineering Technology: What Employers Want", Journal of Engineering Technology, Spring 1992, p 5-8.
- 2. Traditionally credited to Yogi Berra

- 3. Goetsch, D. L., Davis, S., <u>Introduction to Total Quality</u>, Macmillan College Publishing Company, New York, New York, 1994.
- 4. Scholtes, Peter R., The Team Handbook, Joiner Associates, Inc., Madison, WI, 1988

Partnership Councils: A Breakthrough in Dealing With Labor-Management Relationships or Another Passing Total Quality Management Fad.



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Partnership Councils: A Breakthrough in Dealing With Labor-Management Relationships or Another Passing Total Quality Management Fad.

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Abstract

With the signing of Executive Order 12871 on October 1, 1993 by President Clinton, a new era of labor-management partnerships was launched within the federal government. In keeping with the principles of Total Quality Management and the administration's goal of reinventing government, Plattsburgh Air Force Base in New York, created a new Partnership Council between labor and management. The purpose of this paper is to highlight the formation of this Partnership Council at Plattsburgh that began in February 1994. The background, organizational structure, training and implementation strategies used to initiate the Council will be highlighted, as well as the lessons learned.

Recent changes in the world and our nation have resulted in dramatic reductions and downsizing of both military and civilian employees of the Department of Defense. A fundamental change in the way we conduct business known as the Quality Air Force (QAF) philosophy has been implemented throughout the United States Air Force. Based upon the principles of Dr.W. Edwards Deming, the QAF process formally began at Plattsburgh Air Force Base, New York in May 1992. In keeping with this new philosophy, the federal government was also looking at ways of improving the basic processes in government. One of these areas focused on labor-management relationships. To better understand the backdrop of this new concept, a brief history of labor-management issues needs to be addressed.

According to Cherrington (1991), the long record of strife in labor-management relations convinced many that legislation was needed for the benefit of both unions and employers. This led to the passage of the National Labor Relations Act by Congress in 1935. The basic intent of this act was summarized in Section 7 of the Act which states:

Employees shall have the right to self-organization to form, join, or assist labor organizations, to bargain collectively through representation of their own choosing, and to engage in concerted activities, for the purpose of collective bargaining or other mutual aid or protection.

This Act, also known as the Wagner Act, established the National Labor Relations Board (NLRB) to administer the act in a peaceful and democratic manner. In 1947, the Wagner Act was amended by the Labor Management Relations Act, popularly called the Taft-Hartley Act. Under the provisions of this act, collective bargaining was retained as the basic direction of national labor policy, but greater restrictions were imposed, especially on what the unions could legally do. It was not until the 1960's that these issues appeared in the public sector, namely government. With the rapid growth of public employees during this time frame, collective bargaining was allowed with the issuance of executive orders by President Kennedy and later presidents. This eventually led to the passage, by Congress, in 1978 of the Civil Service Reform Act that provided federal employees with many of the same collective bargaining protections as the National Labor Relations Act.

Despite the seemingly adversarial roles between labor and management, research appears to conclude that people belonging to two different organizations tend to remain loval to both despite the fact that the roles and norms of each group could come into dissonance. Derber, Chalmers, Edelman and Triandis (1965), in a study of 37 industrial plants, obtained results which indicate that managers' attitudes toward the union and union leaders' attitudes toward management are positively and significantly correlated. Each group was moderately favorable in its attitude toward the other. In addition, Miles and Ritchie (1968) reported that high-ranking union officials "agreed" that shop stewards and rank-in-file members should be encouraged to participate more in company decision making, and that such participation would result in improved morale, better decisions, and more employee "buy-in". This was an effective shift in perceptions, where each side came to view the other as basically similar rather than different to itself- as part of their "us" category, rather than as part of the "them" category. Research findings suggests that one approach lies in the establishment of some superordinate goal. That is, conditions can be arranged so that the two sides work as a team versus competing against each other. The benefits of superordinate goals has been supported in classic research by Sherif and his associates (1961). Their investigations found that when opposing groups had to work together to achieve common goals, their perceptions of each other improved, while conflict decreased. In sum, it would appear that either reminding the parties to a conflict of their shared goal (e.g., the overall success of the mission or goal), or actually establishing such objectives can be a highly effective means for resolving issues and confrontations.

A similar view was presented by Lassey and Sashkin (1983) who looked at the changing role of the modern manager. They noted that the traditional role or concept of leadership as being vested in the formal leader must change if human growth, satisfaction, and increased organizational effectiveness are valued outcomes associated with work in our society. Both the design of work and the focus of decision making must be altered so that the work group becomes responsible for the planning, organization, direction and control of work. They go on to say that the change of the focus of the managerial role to

the management of the interdependencies in organizations is an enabling change. It enables work groups (partnerships) to work collaboratively because they have the power to make decisions with respect to how work gets done. In addition, the role of the manager changes from a hierarchical to a collaborative role. The role requires dual representation - representing the work group to the organization and the larger organization to the work group. It becomes more of a facilitative, advising and consensus role, a role that will offer new challenges and require very different values, skills and paradigms. Results of these and numerous other studies would seem to indicate that individuals, when members of two different organizations (e.g., union-management) with conflicting goals, tend to express loyalty to both. Mangers and union officials tend to view each other in generally positive terms. Conflict between them is relegated to specific issues, particularly those involving their respective powers.

With the recent infusion of the Total Quality Management philosophy throughout the federal government, new ways of dealing with the traditional methods of labor-management relationships have been initiated. As stated in the President's Executive Order 12871 (1993), "Only by changing the nature of Federal labor-management relations so that managers, employees, and employees' elected union representatives serve as partners will it be possible to design and implement comprehensive changes necessary to reform Government. Labor-management partnerships will champion change in Federal Government agencies to transform them into organizations capable of delivering the highest quality services to the American people." The primary purpose of the order is to change the nature of federal labor-management relations to create labor-management committees/councils, involve unions as full partners in decision making, provide systematic joint training, and to negotiate with unions on 7106(B)(1) matters. The tools they would use in accomplishing these objectives included: interest-based bargaining, consensus decision-making, and joint identification of issues for bargaining.

With this as the backdrop, the concept of a Partnership Council at Plattsburgh Air Force Base was formed. Discussions were held between the Chief, Civilian Personnel Flight and the Union President, American Federation of Government Employees (AFGE) Local 3735, concerning the desirability of pursuing such an endeavor. A mutual agreement was reached, in principal, to seek training on the concepts of a partnership council. The intent at this point was not a determination to form a council, but seek more information on the concept. The Federal Labor Relations Authority (FLRA) was created by Public Law and was instituted with a number of duties and responsibilities which include: the determining of the appropriate bargaining units, supervising or conducting elections, determining compelling need and negotiability, resolving unfair labor practices and resolving exceptions to arbitration awards. FLRA was in a position to provide training to organizations contemplating the formation of such councils to address labormanagement issues. As such, the FLRA Office of the General Council, agreed to provide a two day workshop encompassing the above concepts to representatives from labor and management. FLRA provided two trainers, one from the New York office, the other from Washington DC. Workshop content consisted of the following principles: roles of union and management, goals of the parties, trust between parties, exploration of conflict, concepts of partnerships and the meaning of partnerships. Additional issues involved the current status of collective bargaining in the federal sector and the impact of the Executive Order on collective bargaining. Representation at the two day workshop consisted of an equal number of participants from both labor and management, selected by each group (thirteen from each). Figure 1 depicts how they are set up organizationally.

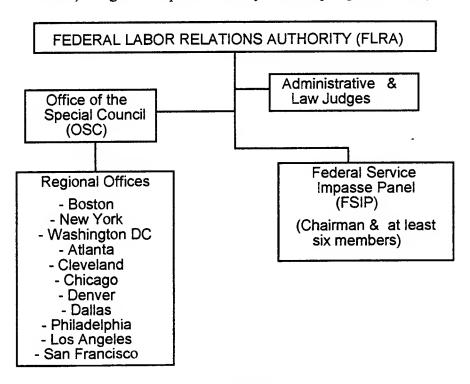


Figure 1

Throughout the workshop, it was evident each side felt there must be a better way to approach conflict resolution with a more open approach to issues affecting each. At the conclusion of the workshop, the FLRA representatives restated their intent was to train, and now both labor and management should decide whether to form a partnership council or continue with business as usual. At this point, FLRA changed roles from that of teacher to facilitator. After discussing the issues, those present decided to forge ahead and form the council. To demonstrate their commitment, a sub-committee was formed to address what each felt was an important first issue, the creation of a mission statement. The following is the mission statement developed for the Plattsburgh Air Force Base Partnership Council:

To provide a forum to address labor-management issues. The council will focus on enhancing mission accomplishment, promoting employee welfare, facilitating communication, and streamlining problem solving.

Before the conclusion of the workshop, a determination on the composition of the council was addressed. The actual council would consist of four representatives for each party, and selection was done at this point. Additionally, it was decided to utilize the services of the Wing Quality Management office as facilitators for the council due to their neutral stand on this issue. Since the actual council was formed, the agenda for the first two meetings consisted of developing a charter. Issues addressed in the charter were as

follows: preamble, membership issues, chairperson(s) role, use of technical experts and facilitators, frequency of meetings, agenda items and powers of the council. Regarding the chairperson issues, the union requested the installation commander be an integral part of the council. However, due to varying commitments, he declined and selected the Support Group Commander to act in his behalf. As a demonstration of his commitment to Total Quality Management, and to preclude additional layers of review, he empowered his designee to make binding decisions for him with two stipulations, 1) decisions must not violate existing law and, 2) decisions by the committee must be through consensus. As stated above, the following two meetings of the Partnership Council concentrated on the development of the charter. Each side researched the subject and brought with them various thoughts and recommendations for inclusion in the charter. The following is the results of their efforts. The first to be addressed was the preamble, which reads as such:

In accordance with Executive Order 12871, we jointly resolve to form a new relationship between labor and management as partners. This is essential to help ensure Plattsburgh Air Force Base meets its mission and delivers the highest quality service to its customers. Our labor-management partnership will use the following concepts: mutual respect and understanding, cooperation, open sharing of information, consensus, and joint training.

The previously mentioned mission statement was also made part of the charter. In general, the powers of the council includes their authority to issue binding decisions, the use of sub-committees where necessary, and the authority to make modifications to the labor-management agreement as deemed necessary. The last issue is of particular importance, as Plattsburgh is slated for closure by September 1995, and the current union contract will expire before then. This clause could preclude the necessity to re-negotiate the entire contract, a labor intensive effort, and modify only those parts deemed necessary. This clause could save both parties considerable time, effort and frustration in contract negotiations. The membership issue was a simple one, adopting the idea of four representatives from each party and allowing the designation of an alternate member should the primary be unable to attend. Through consensus, it was determined that the council would be co-chaired by the Union President and the Support Group Commander, again allowing the designation of a substitute if necessary. Additionally, the cochairpersons will agree upon, and publish agenda items prior to each meeting. The decision making process will be done in good faith, using interest-based processes, considering overall workplace issues, with the exception of individual grievances and complaints. However, the basic grievance process itself was considered one of the councils first priorities. The use of technical experts and facilitator(s) was agreed upon on an as needed basis. Dispute resolution was the last major issue addressed in the councils charter. An agreement was reached stating if the council was unable to agree upon a matter it would be referred to a sub-committee comprised of two management and two union individuals to provide recommendations to the full council. If this procedure fails to resolve the matter, then the dispute would be referred to the Federal Mediation Conciliation Service (FMCS) by either one or both parties for resolution. If a private sector mediator is used, costs would be shared equally by the parties.

The groundwork has been laid for labor and management to approach dispute resolution and interest-based bargaining. According to Myers and Killeen (1994), there are at least 14 potential benefits that might accrue from an active partnership and thus can serve as part of a convincing rationale for its initiation: 1) Management and union leaders can have greater direct access to each other, 2) Management and union leaders can have expanded access to information, 3) Networking will be facilitated, 4) Management and union leaders can both have more control, 5) Communication will be enhanced, 6) Better performance outcomes will be achieved, 7) Knowledge will be gained, 8) Better training will be provided, 9) Management and union leaders will better understand each other's organizational functions, 10) Trust will be earned, 11) Shared benefits will be realized, 12) Management and union leaders will work to make changes that are beneficial for both, 13) Early warnings will be sent and, 14) A good offense will become the best defense.

The creation of the "Plattsburgh Partnership" has enormous potential for positive growth. The team concept between labor and management is essential if both sides expect to function effectively. With the realization that Plattsburgh Air Force Base may be closing within the next 18 months, only by a concerted effort by all parties can this difficult transition occur. As Myers and Killeen (1994) so aptly state, "Customers don't care about union-management rhetoric or squabbles," they want performance. The partnership at Plattsburgh is in its infancy and only time will tell if it will be successful. However, they have made great strides in the right direction, and are well on their way to "doing it right."

REFERENCES

Cherrington, D.J. (1991). The management of human resources. Allyn and Bacon. MA.

Derber, M., Chamlmers, W.E., Edelman, M.T., & Triandis, H.C. (1965). <u>Plant union-management relations</u>. University of Illinois Press. IL.

Executive Order 12871 of October 1, 1993.

Labor Management Relations Act of June 23, 1947, 61 Stat. 136, amended by Act of September 14, 1959, Stat. 519.

Lassey, W.R., & Sashkin, M. (1983). <u>Leadership and social change.</u> University Associates. CA

Miles, R.E., & Ritchie, J.B. (1968). Leadership attitudes among union officials. <u>Industrial</u> Relations, 8, pp108-117.

Myers, K., & Killeen, B. (1994). Building union-management partnerships. Quality Progress, April, pp 95-97.

Sherif, M., Harvey, O.J., White, B.J., Hood, W.R., & Sherif, C.W. (1961). <u>Intergroup conflict and cooperation: The robbers' cave experiment.</u> University of Oklahoma Press, OK.

The Wagner Act of July 5, 1935, 49 Stat. 449.

Quality in Battle Dress Uniform



Col Thomas D. Accola

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QUALITY IN BATTLE DRESS UNIFORM

WORLD CLASS WEATHER SUPPORT FOR THE US ARMY IN EUROPE

Col Thomas D. Accola 7th Weather Sqaudron (USAFE)

ABSTRACT: This paper shows how a small weather squadron composed of widely dispersed units has addressed interservice challenges with a Total Quality game plan. The close integration of USAFE's 7th Weather Squadron with its Army customers offers a unique perspective on the application of Quality Air Force concepts in a joint environment. Growing 7WS cooperation with allied and US Navy meteorologists in Europe adds another dimension to the squadron's efforts to employ Quality Air Force, Total Army Quality, and Total Quality Leadership concepts in tandem to help satisfy expanding requirements for weather support to relief and peacekeeping operations throughout the theater.

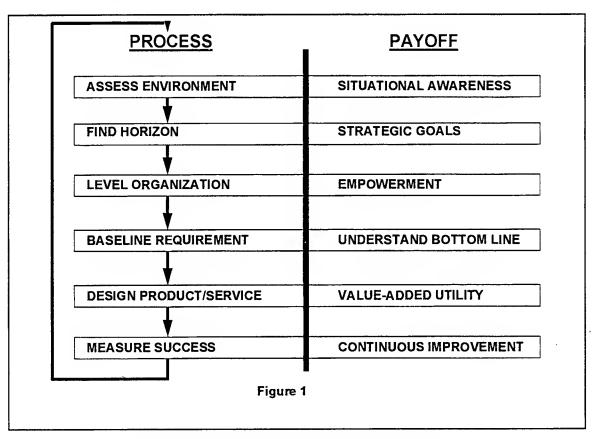
ARMY WEATHER SUPPORT AND TOTAL QUALITY MANAGEMENT

The USAF provides operational weather support to the Army in accordance with the 1947 National Security Act that created the Air Force as a separate service. This decision has had some interesting consequences—one is that a large number of USAF recruits train to be forecasters and observers, then find themselves stationed on Army forts and deployed on field maneuvers with their Army customers. The joint directive that establishes the covenant between the Air Force and Army regarding weather support provides for maximum integration of these weather men and women with their Army customers. The Army is charged with training, equipping, billeting, and feeding them. Under the operations control of their Army hosts, they deploy not on USAF TDY orders for exercises and field maneuvers, but on the same general movement order and under the same conditions (read that, "tents, no per diem") as their greensuit counterparts. They are truly members of a joint organization, and invariable become members of a BDU culture and camaraderie.

Most USAF weather organizations have practiced some form of TQM since it was introduced as a DoD/USAF way of doing business. They were part of a stovepipe command, the Military Airlift Command's Air Weather Service, until the USAF's 1991 reorganization. MAC provided many weather members with early quality training and experience; baselining customer requirements, facing customers across the forecast counter (and often receiving unfiltered face-to-face feedback on product value), and applying statistical process control to determine forecast accuracy have long been a part of the weather service business. But restructuring, a new emphasis on jointness, and new missions for US forces stationed overseas, combined with the impact of modern weapons systems and advanced technologies, make quality implementation both more appropriate and more challenging in the 1990's. Nowhere is the challenge greater than for those weather units supporting the US Army's 65,000 soldiers and 600 combat aircraft in Europe.

ESTABLISHING A TOTAL QUALITY GAME PLAN

Building a world class organization at any level requires a total quality game plan. At 7WS, we established a TQM approach--a process approach. We used the step-by-step plan illustrated at Figure 1 to achieve excellence. As we executed this game plan, we found that each step was a process in itself, that each process became a building block and the logical basis for the next step, and that working through each process resulted in a payoff for our people--both managers and workers. As with any effective total quality initiative, our game plan is continuous. The "game" is never over--we periodically renew each process, from assessment through measurement, to make our total game plan work.



ASSESSING THE TQM ENVIRONMENT

Any organization attempting to implement Total Quality is confronted with organizations and cultures that are either nurturing, nonconducive, or neutral in its efforts. A thorough initial assessment of the TQM environment is crucial to the success of any quality plan. In the military, quality leaders must deal with the nature of the next higher level of leadership: Is higher head-quarters actively instituting a quality plan of their own? Does it involve/commit your unit? Are command resources available to support your quality efforts, and are your own quality initiatives "bounded" by the overall command plan? Or, are you "on your own" when it comes to implementing Total Quality? The answers will profoundly impact your quality journey. At 7WS

we began on our own. However, as USAFE expanded command-wide quality initiatives, we took advantage of the increased resources and training that resulted. We also confirmed that our game plan was in sync with USAFE's.

Organizational and community cultures are big quality players, particularly for overseas units. In Europe, we found it impossible to separate many of the basic quality of life issues that impact service members and their families so profoundly--housing/schools, BX/commissary facilities, dental/medical care, even local armed forces television programming/availability--from the workplace quality issues we were trying to address. Overseas, they are all part of the same fabric; the whole cloth that makes for a productive, well-trained service member. If our quality efforts didn't include these things that were so important to our people, any progress at the office could have been diminished by dissatisfaction off duty. We could not insulate our organizational culture from these basic issues. Nor could we ignore the current personnel environment from our quality considerations--with RIFs, SERBs, and early-outs impacting the lives of our people, we had to consider them--even if we couldn't do anything about them--as we pieced together our game plan.

We found that while many of these issues were detrimental to our quality efforts, we could alleviate some of the pain associated with them by carefully and completely explaining what was happening, and why. A very big part of our initiative involved educating our people about community and Air Force issues that might impact them. We didn't eliminate anxiety, but we reduced it; and we experienced a greater willingness by our people to forge ahead and focus on the quality initiatives that they were empowered to influence.

BDU BARRIERS TO TOTAL QUALITY

We also knew that our Army customer's attitude toward Total Quality would present us with unique challenges; to what degree would they understand and accept what we were trying to do? We encountered general acceptance and even found Army units and Army senior leaders that were vigorously pursuing Total Army Quality--the greensuit parallel to Quality Air Force. Single Soldier initiatives, the Army Communities of Excellence program, and a high visibility effort to establish Quality of Life standards for the communities in which soldiers and their families live are ample evidence that Army leaders in Europe know what quality can do for their commands. However, as in the Air Force, commitment to Total Quality varies greatly from unit to unit and from installation to installation. The quality efforts we discovered were combating deep-seated cultural obstacles--we call them BDU barriers to total quality, and they aren't isolated to the Army--any military organization implementing quality initiatives must deal with them.

The very fact that Total Quality involves cultural change rubs many soldiers wrong right from the start. Comfortable with the military culture they've "grown up" in or joined, they don't recognize that it has changed, and cannot accept that it will continue to do so. They resist perceived threats to BDU culture adamantly. Another common perception we encountered: empowering the troops, who must be told exactly what to do to be effective, will dilute authority, endanger the chain of command, and generally create chaos. The basic rationale is you can't trust the troops-they're either incapable or unworthy of that kind of self-government. Many of the leaders we talked with firmly believed that instituting the kind of rapid, radical change that most Air Force

units have undergone in the last three years as a consequence of restructuring, downsizing, and total quality implementation would destroy the very fiber of the Army's go-to-war capability. Other common barriers to quality implementation in a BDU environment include delay and denial, typified by phases like "not on my watch," and, "we'll give it a try when we reach 'end state'"; generally defined as stabilization of the force in the FY 95-99 time frame. And of course, many leaders who are only vaguely aware of TQM's guiding principles (teamwork, vision, empowerment, etc) and don't fully understand the totality of the changes that true quality involves, sincerely believe they've always been "quality" leaders, and have little left to do in this arena.

It would be unjust to discuss these quality barriers in the context of Army weather support in Europe without mentioning the increased focus on quality of life by senior leadership in this theater. The US Army, Europe's senior leaders have linked the efficacy of the support structure for their soldiers in Europe to a trained and ready force, and are making concerted efforts through the programs mentioned above to make life better for their people--in order to meet the rising expectations of a better educated, more demanding Army population for better facilities and service. The message from these leaders is loud and clear, but, they must battle the same bureaucracy, operate within the same resource constraints, and confront the same cultural barriers that all of us attempting to implement quality in the US military encounter.

SITUATIONAL AWARENESS

The TQM environmental assessment payoff for our squadron, across the board, was situational awareness. From the very beginning, we had an idea of what we were up against: what resources would be available, what guidance we had to follow, what obstacles we were likely to have to overcome. We didn't pursue our TQM game plan with eyes closed or blinders on; we realistically assessed the possibilities, and pressed on to the next step in our plan.

FIND THE HORIZON

Having looked in all directions to assess the environment, we then had to determine a heading; where were we going? We actually had two visions to help us get oriented: the USAF vision, which centers on people and air/space power, plus our Army customer's vision, which focuses on training, readiness, and decisive victory. We knew we wanted to build a world class organization that was part of the Army's combat team. We realized we had to focus on combat readiness. Thus, 'world class weather support for America's combat team in Europe' was a succinct, appropriate target on the horizon for us to fix in the sights of our 'quality' artillery. if what we were doing wasn't contributing to world class weather support, then we didn't need to be doing it.

STRATEGIC GOALS

Our view of the horizon would be little more than a pleasing dream without a strategic plan to take us there. The initial steps of our quality game plan had been relatively simple. The phrase "world class weather support" sounded great; but, we really had to put on our visionary thinking caps to come up with the goals that would get us there. In retrospect, our customer's new

strategy, which calls for force projection and includes relief and peacekeeping missions vice the old cold war motif of in-place defense of Central Europe, was helpful. It required us to think in new ways about how to support our customer. We recognized the need for an architecture that incorporated new technology and automation with better training. We discovered that we could better synchronize our weather products and services with the operational decisions of our warfighting customers. Additionally, we decided that total quality called for a new approach to the management of our 20 field units--we had to ensure they had the opportunity to make quality work at their level.

Finally, we needed to take full advantage of the capabilities of our counter parts in the US Navy, as well as fellow allied/NATO meteorologists. We found that two "new realities" aided this process. First, the USAF restructuring had removed us from a stovepipe weather organization that tended to dictate the sources and methods we used to produce operational forecasts. Now, we have other options; for example, two CONUS-based weather centrals, one Navy and one USAF, vying to provide us with the "big-picture" products we use to make good mission-tailored forecasts. We can access a wider range of these products. Further, competition has been introduced--both centrals have become very responsive as they compete for our warfighter-related business. We've also begun a new, more cooperative relationship with Navy weather units in the European theater, recognizing that with drawdowns and budget cuts, it makes more sense for us to pool our resources rather than keep each other at arm's length.

A second 'new reality' is that any major land operation in Europe will be conducted in a combined environment--we had to think in terms of multinational operations rather than US-only, go-it-alone scenarios. This opened up all kinds of value-added opportunities for us: from persuading our allies to step up to more responsibility as we drew down our US forces in Europe, to linking European weather centrals to take advantage of their excellent midrange forecasting capabilities. We even found another military weather service, the British Meteorological Office, that has an extensive TQM initiative of its own. The parallels between their experience and ours have provided us with valuable insight into how to make quality work for us.

These brief paragraphs hardly do our strategic plan justice-they merely outline its framework. Making these noble-sounding ideals work involved a great deal of planning, programming, coordination, and just plain hard work by our staff. But it gave each member of our organization goals to shoot for and an idea of how their work fit into our overall plan for the squadron. It helped them understand how they were contributing to our overall effort to build a world class organization; that they weren't working in isolation; that they were part of the team and part of the vision.

LEVELING THE ORGANIZATION/EMPOWERMENT

Streamlining our small, 22-member squadron staff seemed like a relatively simple, cut-and-dried, logical thing to do. Before leveling, our structure had small orderly room, information management, and liaison divisions, plus one large operations division consisting of four 2-3 member branches. We'd built in overhead and allowed each division chief to create his/her own "fiefdom". They had been independently working for the Commander, frequently in disagreement

and competition with the Operations Officer, who was also the only other field grader on the squadron staff. Streamlining broke some of these fieldoms up, which didn't sit too well with their chiefs. However, it soon became obvious that the new structure made for a more efficient, team-oriented staff all around. From the action officer/NCO perspective, we'd eliminated internal boundaries that had prevented the squadron's orderly room, information management, and liaison functions from being as responsive as they could have been and provided better easier access to the squadron's leadership. The Operations Officer gained more authority to manage all aspects of the staff, but in turn had to empower his subordinates to work more independently and become more responsible for their own work.

BASELINING CUSTOMER REQUIREMENTS

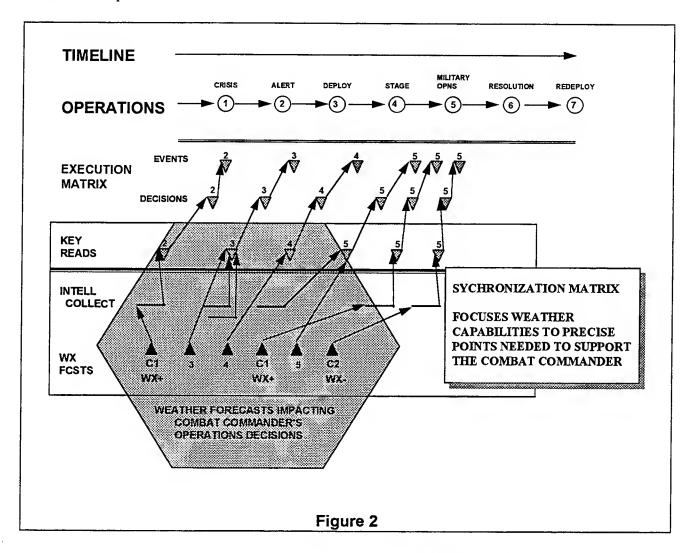
In an era of declining defense budgets, a thorough, honest appraisal of a customer's needs and your ability to meet them can be a real "gut-check" for a military service organization. There is always the chance that the real requirement has gone away, technology has made your organization obsolete, or that the luxury of your services can no longer be afforded. Determining why your organization is needed and whether your services are really worth what the US taxpayer shells out for them is a necessary part of your quality game plan. In 7WS, we established a hierarchy of customer needs for weather service ranging from resource protection to aircrew briefings; from weapons choices by tactical commanders to scheduling training activities to coincide with favorable weather. We then tried to associate a value with a specific product. For example: we found that the Army's new Apache helicopters cost the taxpayer about \$10M. We then looked at our 200-member squadron's payroll: about \$7M per annum. We also calculated that each of our weather stations runs up an average \$26K to operate and maintain. We also figured in various technology upgrades that make the total recurring annual DoD bill for our weather squadron about \$10M. Thus, if we save even one Apache helicopter from loss in a weather-related incident, we've earned our keep for the year. The problem, of course, is that it is very difficult to prove that you actually saved resources with a good forecast. However, the exercise is beneficial across the board in showing your people and your customers just how much your services really mean to them.

DESIGNING VALUE-ADDED PRODUCTS/SERVICES

Developing value-added products and services for your customers is an intensive process, and a special challenge if your customers don't have active quality initiatives of their own. For example: how do you form a process action team with customer representation if your customer can't spell "quality"? Our answer was to offer USAF quality training to key customer representatives. The response was surprising. Many customers who were reluctant to institute quality principles, tools, and techniques. Additionally, having members of another service participate in our training sessions added a unique dimension to them, and really helped us to understand the culture we were dealing with in an Army environment.

The process illustrated in Figure 2 show how just one part of the product design process worked for a key 7WS customer; the intelligence function at Army tactical units. We carefully studied

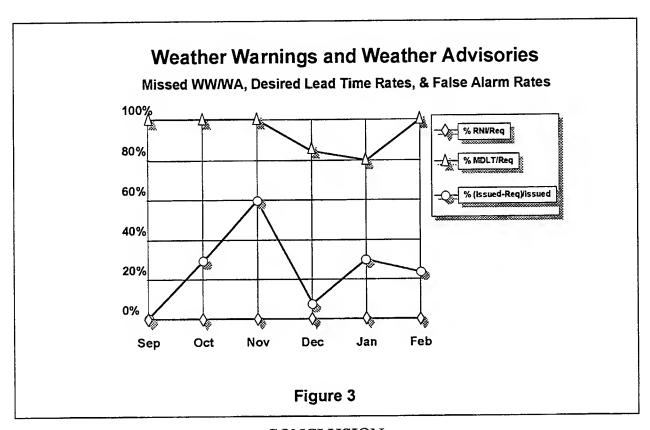
their internal intelligence production process, recognizing that it was keyed to battlefield events and decisions. We were then able to correlate and synchronize our weather products to the combat commander's operational needs. This in turn, drove not only the design of our products, but also the processes that created them.



MEASUREMENT/CONTINUOUS IMPROVEMENT

Measuring success is the last step in our quality game plan, and in many respects, it remains the most difficult. We had always been accustomed to using statistics to measure our success as meteorologists, but it was success on our terms: forecast accuracies measured to the second decimal point that had little operational meaning to our customers; observation accuracy based on format rather than content. We even had an AF/Army-wide program at one time called operational verification: it attempted to measure forecast accuracy in operational terms, and included mandatory reporting to the local customer; but despite the name, 'OPVER' never really succeeded; we still seemed to be defining success on our own terms--not our customers'.

Our initial efforts to make metrics more meaningful involved defining and measuring success in terms to which our customer could relate. For example, we now provide customers of our severe weather warning and advisory services with graphical representations of product accuracy: how many "hits and misses" we accrue from month to month (see Figure 3). We calculate similar statistics for key weather elements like clouds, precipitation, and their timing. While these graphs miss the mark in measuring the actual value of our weather services, they do define our technical health and tell us where to focus our improvement efforts. We've also learned how important the presentation and dissemination of our weather forecasts are. We can make the best prediction possible from a technical perspective; but, if we haven't conveyed its significance in terms that have meaning to our customers, we've failed.



CONCLUSION

7WS efforts to practice quality in BDUs have led to notable successes in improving weather support to the US Army in Europe. These successes include: accelerated acquisition and installation of new technology; the rapid implementation of modern warfighting concepts that are radical departures from long-standing doctrine; and increased interaction and cooperation with allies and the US Navy. Empowering the bright young officers and NCOs on the squadron staff and at field units has encouraged innovative solutions to tough operational problems, and given supervisors more time to take care of their people. 7WS members have won seven USAFE-level awards in the last 12 months: supervisors now have the time to prepare top-notch nominations for empowered squadron members whose contributions to mission success are easier to identify and articulate. The squadron's total quality game plan has made winners of its members and its customers.

REFERENCES

- 1. Prowse, Lt Col Mike, Total Quality Management: A leadership Revolution, Air Force Journal of Logistics, pp. 4-7, 21, Winter 1990.
- 2. Stewart, Maj Gen John, USAREUR Intelligence Strategy: "Intelligence in Force Projection", from a briefing presented at Hq, US Army, Europe, Heidelberg, Germany, Fall 1993.

PART VII

Team Presentations

Aim 9 Missile

18th Wing Kadena AB, Japan

AIM 9 MISSILE 18th Wing Kadena AB Japan

From the tiny island of Okinawa, Japan, 18th Wing F-15C/D Fighter Aircraft stand ready to provide Air Superiority for the Pacific Forces. One weapon used to prosecute this mission is the AIM-9 Sidewinder heat-seeking missile. To destroy the enemy in air-to-air combat, and ensure our Wing's ability to produce its primary product (i.e., Airpower), our pilots need reliable weapons. This is the story of how our team used Quality Principles to resolve our chronic AIM-9 missile reliability problem and give our Pacific Air Forces "A Fighting Team Second To None!"

For as long as anybody could remember, the AIM-9's performance was less than optimal. In fact, the AIM-9 process was averaging about 102 in-flight missile malfunctions per month, making the weapons system one of the top five failing systems in the Wing. If the Wing was to improve it's Key Process of "maintaining ready aircraft, munitions, and support equipment," the most logical place for us to start was with the AIM-9 process.

Our team was chartered under the then newly reorganized Intermediate-Level Repair Enhancement Program (IREP). The IREP, under the authority of the Wing, Operations and Logistics Group Commanders, and PACAF Regulation 65-3, is responsible for affecting base-level repair capability and reducing impediments to the repair cycle. The program is designed to provide Wing leadership with a means of improving self-sufficiency and combat capability. IREP does this by assessing and prioritizing improvement opportunities with the Wing Quality Council and chartering Process Action Teams (PATs) to improve them. Our AIM-9 PAT is one such team.

If we could fix our AIM-9 reliability problem, we would be directly improving the Wing's combat capability at the point of impact. Because of the criticality of the weapon system, we felt it was important that our team focus on the needs of the primary user of the AIM-9 missile. For this reason, we identified our pilots as our primary customer. (After all, it's our pilots' lives that hang in the balance should our missiles fail.) In the final analysis, as far as our customers were concerned, it all came down to one thing. Our pilots wanted weapons systems that worked . . . reliable AIM-9 missiles.

First, we brainstormed an Opportunity Statement based on our team's Charter. This statement defined the improvement opportunity, the beginning and end of the process to be improved, a measurable indication of why it was important to work, the expected improvement, and the customer who would benefit most from our team. Then, our team developed flowcharts to identify the process as defined in our Opportunity Statement, "... beginning with a serviceable missile being turned out of the 400th MMS missile shop and ending with the missile performing successfully for our ultimate customer, the pilot."

We measured customer satisfaction in terms of pilot-reported discrepancies in the Core Automated Maintenance (CAMS) data base and feedback from our pilots, maintainers and our senior leaders. Pilot-reported discrepancies from CAMS were put into checksheets then transferred to Pareto charts for analysis by our team. Our whole focus was to reduce the malfunctions by analyzing the data and developing, testing and implementing process improvements using the seven-step Continuous Improvement Process (CIP) model.

Our Pareto analysis showed missile "No-cool" and related malfunctions as our biggest opportunity for improvement within the AIM-9 process. After our Pareto analysis of the existing data in CAMS, we brainstormed the causes of the "No-cool" and related malfunctions in four categories: Argon Bottle Not-Seating, Damaged GCU Probe Tips, Maintenance Practices, and Pilot Discrepancy Reporting. We then verified the actionable root causes having the greatest probable impact on our missile "No-cool" and related pilot-reported discrepancies.

We planned, tested, and implemented solutions for our root causes. We closely monitored our plan's effectiveness using data we collected on system performance during two six-month Plan-Do-Study-Act (PDSA) cycles of process improvement. We also made adjustments to the plan, when needed, to ensure continuous improvement.

AIM-9 pilot-reported discrepancies dropped from 102 to 34 per month -- a 67 percent decrease! Our "No-cool" and related malfunctions also decreased sharply when compared to figures collected before our team was formed, showing a direct correlation with the overall decrease in system failures. That is, as we decreased the "No-cool" and related malfunctions, overall system performance improved significantly. We also enjoyed a significant man-hour and dollar savings due to the improvement effort.

All process improvements listed in our action plan, including those developed during two PDSA cycles of process improvement, were published in the Wing Weapons Academics lesson plan, a local checklist, maintenance operating instruction, and local aircrew operating procedures. Standardized procedures enhanced training capability for our pilots and maintainers, ensured continuity as personnel rotated assignments, and formed the basis for continual process improvement (even after our team was officially closed). Process performance is currently monitored by the Wing Weapons Working Group. Using the same metric, AIM-9 missile pilot-reported discrepancies, the Wing is able to maintain its gains in AIM-9 missile reliability.

We shared our story and lessons learned at the Worldwide Weapons Product Improvement Working Group and with the PACAF Weapons Manager and PACAF Gold Flag Conference. In this way, we reached F-15 and AIM-9 missile units from around the world. We also gave demonstrations to commanders at all levels; the Wing Quality Council; Wing QAF Awareness Classes; maintenance managers, technicians, and supervisors from all levels; visiting VIPs from the Air Force Logistics Community; and the 1994 Air Force Daedalian Tour.

Our lead, and success, as a charter IREP team led to other teams being formed to resolve F-15 Fire Control, F-15 Flight Controls, and Repair Cycle Bottleneck Reduction, to name a few. By showing how Quality Principles can directly affect mission capability, we paved the way for other significant improvements in the Wing.

The 400th MMS Missile Shop is working on a suggestion to the Depot to have the GCU probe tip re-engineered to make it a replaceable item. Currently, tips are not replaceable and the entire GCU has to be shipped out when the probe can no longer be fixed to accept a good agron seal. Also, they are submitting trend data on the in-shop missile tester to the Depot for analysis. The tester tends to pass GCUs that fail on the aircraft repeatedly and are in need of improvement.

Our team's experience had a positive influence on the Wing's Quality Movement. First, we influenced the start of many more cross-functional teams through the IREP. Second, we influenced a greater spirit of cooperation between our pilots and maintainers throughout the Wing. Third, our success fueled the fires of Quality and process improvement outside the IREP across the Wing. Finally, our efforts were used to update QAF courses with real examples and lessons learned.

Coordinator: TSgt Mitchell A. Villanueva

Awards and Recognition

325th Civil Engineer Squadron Tyndall AFB, FL

AWARDS AND RECOGNITION 325th Civil Engineer Squadron Tyndall AFB FL

The 325th Civil Engineer Squadron Award and Recognition Process Action Team (PAT) has celebrated team success and recognition! The team evaluated the past awards and recognition program and totally reconstructed the squadron's quarterly awards and recognition program.

In November 1992, the PAT formed and began a series of teambuilding and Total Quality Management (TQM) training workshops. The key to the team's success was taking additional time for the "forming, storming, and norming" stages of group development. In mid-January 1993, the team began gathering and analyzing data. The factors identifying the awards and recognition program as a target of opportunity for improvement were well documented. Customers expressed dissatisfaction with the process and stated so in the Air Combat Command (ACC) Quality Culture and Leadership Survey. Squadron personnel spoke up again during an organizational survey (environmental scan) in preparation for the squadron's strategic planning. The final and perhaps most telling evidence in the process was experiencing the diminishing participation; most quarters, award nominations were zero.

The PAT used a seven-step problem-solving model to improve the current process. Customer needs were gathered and used as the team progressed through the problem-solving model. The result was a new, peer-recognition approach to awards and recognition through development of both a formal and informal recognition system for use by all CE personnel, military and civilian.

First, an informal recognition system, called "Quick Pat," was developed. Quick Pat is a very rapid and easy way for supervisors, work colleagues, and customers to recognize superior performance, service, or a special deed by an individual. A form was developed, eliminating the need for a special letter to be written. The Quick Pat initiator handwrites the form and drops it into distribution to the flight chief. The person recognized not only gets very fast, positive feedback, but also a lasting record for his or her personnel file; the submitter gets an easy way to recognize superior performance or service. Later, at quarterly CE awards ceremonies, all Quick Pats submitted during the quarter are placed in a drawing box. The commander randomly draws three Quick Pat forms; these three winners receiving a non-monetary incentive prize.

Next, the formal portion of the awards program was evaluated. A well-defined process was already in place, however, customers were not satisfied with the system as it was. The PAT totally revised the system based on customer defined needs. On a quarterly basis, all squadron personnel may now submit any squadron member for an award in one of seven categories. A significant improvement made to the CE award program was the PAT suggestion to form a Quality Award Board (QAB). There are nine members -- one representative per flight -- on the QAB. The QAB's charter is to be the reviewing, evaluating, scoring, and selection committee for all quarterly submittals in the seven categories. Board members apply scores to individual submissions. One role of the QAB chairman is to tally the points assigned by each QAB member to determine the winners in all categories, then identify and announce the winners to the CE Commander. To ensure they did not overlook anything in the definition of QAB roles and

responsibilities, the PAT conducted a role-playing session of a QAB meeting. This technique was extremely valuable, with areas requiring additional clarification quickly and clearly identified. Confusing areas were then modified or clarified prior to the publication of the final package.

To reward the winners from the informal and formal recognition processes, the team discovered that funds may now be used to purchase incentive award items such as logo windbreakers, watches, pens, and mugs. Also new is the award of incentive time off for civilians, which may also be used to recognize quarterly winners.

The PAT placed its final touches on the CE Awards and Recognition Program package in October 1993. Once signed by the CE Commander, this package became the squadron operating policy governing this valuable program. In October 1993, a test program was run; the PAT had done such a thorough job of defining all aspects of this program that no changes were required. To date, 139 personnel have been nominated with winners in all categories; however, as is said in CE, all nominees are winners by virtue of their being nominated!

Another significant success indicator is that the program has become the Tyndall AFB model for awards programs basewide. Requests for copies of the program package have also been received by other AETC bases as well as other MAJCOMs and their bases.

The CE Awards and Recognition Program has certainly received considerable review and attention by numerous people. The programs greatest tribute, however, is that it successfully incorporated the identified needs of CE customers for peer recognition capability into a working reality.

Coordinator: GS-12 Linda Winslett

Deactivation Quality Improvement Team

351st Missile Wing Whiteman AFB, MO

DEACTIVATION QUALITY IMPROVEMENT TEAM 351st Missile Wing Whiteman AFB MO

The current 351st Missile Wing (351 MW) deactivation plan was developed in 1991 as a result of then President Bush's direction to standdown the Minuteman II Intercontinental Ballistic Missile fleet. After operating under that plan for two years, several areas of the plan deserved review. The 351st Missile Wing commander directed a cross-functional team (operations, maintenance, communications, civil engineering, and security police) to re-evaluate the processes for improvements and recommend areas where the wing could achieve greater efficiencies. The team's goal was to streamline the process to improve resource re-distribution, reduce costs, and review personnel requirements while preserving safety and security.

The Deactivation Quality Improvement Team (QIT) had a threefold charter.

- (1) Examine the 351 Missile Wing's current deactivation plan and schedule. By doing this, the team searched for ways to improve the wing's process of deactivating launch control centers (LCCs), missile alert facilities (MAFs), and launch facilities (LFs).
- (2) Explore required manpower methods for monitoring launch facilities awaiting caretaker status while maintaining adequate safety and security.
- (3) Examine the early removal of LCC, MAF, and LF communication, weapon system, and support equipment to accelerate the current deactivation process.

Before the team embarked on its charter, it investigated the external factors influencing deactivation of the 351 MW.

- (1) Strategic Arms Reduction Treaty (START). After consulting with the 351 MW .START office, the team determined that START had no influence on the early deactivation of the wing. The team was directed to keep the START office informed of all deactivation time schedules.
- (2) Environmental Impact Statement. After the team examined the environmental impact statement, it determined that early deactivation was insignificant because the final deactivation date would still be in FY 1995.
- (3) Skelton Amendment. The Skelton Amendment is legislative law that requires the 351st Missile Wing to be the last wing to retire the Minuteman II weapon system. After several discussions between the team members and the guidance team, it was determined that to deal with this issue would be out of the scope of the team's charter. Identifying the Skelton Amendment as a potential influence on any plan was the most significant part of recognizing this external factor.
- (4) Hardness Testing in the Launch Control Center. TRW and Boeing proposed LCC floor testing in conjunction with wing deactivation. TRW and Boeing representatives conducted a site survey 7-11 February 1994. At that time, four of the remaining six LCCs were being considered for the test.

The Seven-Step Model for Continuous Improvement was used to help the team explore the deactivation process because it was the ACC model in use at the time the team was chartered.

- (1) The tools used include brainstorming, flowcharting, cause and effect diagrams, nominal group technique voting, group discussions, and surveys. These tools were used to examine the deactivation process.
- (2) The team thoroughly discussed the technical aspects of deactivation to ensure all team members had a firm understanding of terms and concepts. The following items were discussed:
 (a) missile interconnectivity charts, (b) deactivated sites vs sites in caretaker status, and (c) each organization's role in deactivation.
- (3) The team analyzed the deactivation process by using flowcharting, the deactivation schedule, and testimony from the process owners (missile wing commander, operations group commander, maintenance group commander, squadron commanders, and section chiefs) who were responsible for accomplishing deactivation tasks.
- (4) The team conducted a needs analysis of process customers and suppliers to determine expectations.
- (5) After an understanding of the current process and team member expectations, the team was able to outline problem areas such as time delays in schedules, unproductive use of personnel, unnecessary procedures, and wasted resources (fuel costs, vehicle wear and tear, etc.).
- (6) The team then identified their parameters of operation; external factors impacting the team were addressed.

The team determined that all of the dissatisfaction expressed by the customers/suppliers were symptoms of an inefficient deactivation process.

- (1) The period between missile booster removal and the launch facility being placed into caretaker status was unnecessarily long.
- (2) The manpower requirements for monitoring launch facilities awaiting deactivation were not efficient.
 - (3) Security checks for launch facilities awaiting caretaker status were too frequent.
- (4) The communication squadron should not have had to wait to remove communication equipment from the launch control center that was already shut down.

The team's proposal had four main points; these points are as follow.

- (1) Immediately shutdown one missile alert facility/launch control center (MAF/LCC) in each squadron. This action would leave two manned MAFs/LCCs in each of the two remaining squadrons monitoring their fifty launch facilities. The benefits of this action were personnel, fuel, and MAF/LCC expense savings.
- (2) Accelerate launch facility deactivation to keep pace with the booster removal schedule. By doing this, maintenance teams begin the LF deactivation process within one week following booster removal. This action allows the last LF to go into caretaker status in Jun 95 instead of Nov 95. Significant personnel and procedural savings result by accelerating the schedule by four to six months.

- (3) Immediately remove all communication equipment no longer required in the LCC. The benefits of removing this equipment one year early is quite impressive. This action will allow the communication squadron to close three separate shops (thus eliminating 24 personnel) and in turn reap significant manpower savings.
- (4) Check all launch facilities every two weeks instead of weekly. Existing procedures required security police to check LFs with boosters weekly and LFs without boosters biweekly. The Office of Special Investigations risk assessment reported that Whiteman AFB and the missile complex had no risk; therefore, the team determined the same level of security could be provided to the missile complex with less frequent LF checks. The benefits were reduced requirements for security police personnel and lower fuel/vehicle costs.

Benefits:

- Significant cost savings: thoroughly reduced manpower, driving miles, and resource recovery
- Early personnel release
- More productive use of personnel and resources
- Reduced congestion of deactivation teams in the LCC
- Potential for early inactivation of the wing (6 months)

The 351st Missile Wing began implementation of the revised schedule in February 1994. The QIT's proposal streamlined the deactivation plan and schedule. At the same time, it left enough flexibility to react to unforeseen changes to booster removal actions and external transportation factors.

Coordinator: Capt Jeff Tibbits

DPMR Data Base

HQ Air Force Military Personnel Center Randolph AFB, TX

DPMR DATA BASE Hq Air Force Military Personnel Center Randolph AFB TX

As part of the Air Force Military Personnel Center, DPMR provides worldwide assignment actions in support of Air Force operations. In this capacity, our mission is to provide commanders and other customers with qualified and timely fills for worldwide requirements and to provide Air Force officers, enlisted personnel and families quality assignment service.

As you might imagine, this task is extremely labor intensive. Practically every assignment action taken affects more than one division within the assignment directorate. Coordination is often a problem as action officers move, change jobs, go on leave or TDY, so forth. Additional "bookkeeping" projects levied on the action officer complicate the process even further. These tasks range from simple unit tallies to the more complicated process of force experience analysis.

We formed the DPMR Database PAT (DB PAT) to look at our current processes and explore ways they could be automated and standardized using the tools available with current technology. Because the problem cut across division lines within the directorate, every major assignment area had representation. To round out the team, we included computer experts from within DPMR and the AFMPC small computer support branch.

One of our first steps was to survey our customers, the action officers within DPMR, to determine their requirements. Their requirement was simple and straightforward: a quick, efficient way to retrieve and manipulate real-time data which would also allow them to communicate with other action officers within the directorate. Existing applications did not give them this capability.

After examining several key DPMR processes, the PAT decided to address the primary root cause we saw affecting all: the proliferation of application-specific databases and programs. Practically every section within the directorate had developed its own application to accomplish its tasks, using the tools most familiar to its staff. During the PAT process, we identified eleven different major applications running on three different software platforms. None of these applications were compatible with one another. Practically all were keystroke-intensive and user unfriendly. As a result of these findings, our goal became the development of a PC database product which was flexible enough to support all our users' requirements.

The result of the DB PAT was the Assignment Management System (AMS). The system is based upon a database which gives DPMR personnel the ability to retrieve/store information in real time on officers they are managing. Since all action officers are tied to the same database, all have access to the same information. In addition to this interactive database, AMS provides the action officer with a number of automatic form-generation options. These forms are the culmination of an effort to standardize the information formats used by DPMR. New action officers now only have to be taught how to read the DPMR standard rather than the plethora of forms which existed prior to AMS. Future improvements to AMS will include on-line interaction with the Electronic Bulletin Board, telephone link capability with the field, on-line career

counseling, fax support, and links to imaging systems. AMS has far exceeded our original expectations and promises to become the system which will encompass all assignment actions.

We are implementing AMS using a three-phase approach. Phase I was the actual writing and testing of the system itself. In addition, we provided every action officer in DPMR a four-hour training course on the functions and capabilities of AMS. Phase II and III improve on the basic system by adding features such as automatic form and report generation.

We designed AMS to be expandable and adaptable. Vehicles are already in place which allow our customers to make suggestions for improvement. As updates occur, most are automatically loaded through an icon provided to the user. When selected, this feature gives a short description of the improvement and makes the necessary changes to the basic system. No work is required by the user. Major changes are implemented quarterly, if required. If these changes require training, action officer training is conducted prior to the release. To maintain the AMS system, DPMR has a dedicated staff of two officers. They are tasked with the responsibility of maintaining the integrity of the system as well as incorporating future modifications.

As stated earlier, the Assignment Directorate provides commanders and other customers with qualified and timely fills for worldwide requirements and provides quality personnel assignment service to Air Force personnel and their families. For the first time, action officers at AFMPC have a vehicle to retrieve real-time data on Air Force members. AMS gives us that capability. By developing a system which eliminates much of the time-consuming tasks an action officer had to perform in years past, AMS provides us the opportunity to spend more time with individual customers, thus improving our service to them and to the Air Force as a whole.

Coordinator: Lt Col Deborah Baker

Drone Recovery

82 ATRS Tyndall AFB, FL

DRONE RECOVERY 82 ATRS Tyndall AFB FL

The 82 Aerial Target Squadron (ATRS) is part of the 475 Weapons Evaluation Group (WEG) located at Tyndall Air Force Base, Florida. Its primary mission is to provide aerial targets in support of live air-to-air missile firing programs for the Department of Defense. This is accomplished through the use of remotely controlled QF-106 full-scale aerial targets (FSAT) or the BQM-34A and MQM-107 subscale aerial targets (SSAT). The QF-106 is a modified fighter aircraft capable of manned or unmanned flight and can be equipped with numerous payloads to include electronic or infrared countermeasure systems. This target is used when the mission parameters demand realism in size, maneuverability, and payload capability to meet missile test requirements. Most missile test projects would prefer a FSAT for all live-fire tests. However, the limited supply of retired fighter aircraft are insufficient to meet all missile test requirements.

The BQM-34A and MQM-107 targets are small with a limited payload capability, but they are a cost-effective alternative to using FSATs where the mission test parameters are less demanding. SSATs successfully supported 70 percent of the 373 target sorties for live missile firings during FY93. Through effective scheduling and optimum use of resources, we can meet all our customer needs.

The 475 WEG Quality Improvement Council chartered a quality improvement team from the 82 ATRS to evaluate a quality idea suggestion concerning the BQM-34A SSAT recovery process. The suggestion identified three potential recovery methods and the significant cost impact of the current method of recovery.

The teams objective was to reduce the amount of damage sustained by the drone during recoveries. The primary method for recovering small subscale drones is over land using an 86-foot parachute.

Damage to the drones, caused by the hard landing surface in the recovery area and increased weight from added equipment augmentation, costs more than \$1 million annually. The nose cone, engine, nacelle, J-85 engine seats, and, in some cases, the upper air-frames were damaged.

Team members Capt Richard McKinley, CMSgt Stephen Miller, TSgt David Steinike, and SSgt Kenneth Coulombe selected the following as their target of opportunity: "Determine the most cost-effective method of recovering the BQM-34A subscale target."

The team used a wide variety of problem-solving tools and techniques to examine, analyze, and ultimately improve the recovery process. Initially, the team sought and analyzed data such as drone weight, parachute packing materials, metal construction, field conditions and environmental effects using a cause and effect diagram. The diagram showed the relationship between the variables impacting target repair cost. This cost per mission was then developed using histograms and frequency tables.

From this data, the team generated potential improvements using brainstorming and the nominal group technique. Furthermore, through the use of a detailed solution selection matrix, the team determined that discing the planned drone recovery field to soften the ground would likely reduce damage.

The team's recommendation was briefed to and approved by the 475th WEG quality council. The operation and maintenance contractor was tasked to till the recovery area. The team agreed to monitor the BQM-34A and MQM-107D subscale recovery down positions and damage assessment on a quarterly basis.

Actual cost savings for July through October were more than \$280,000 -- much greater than anticipated. Additionally, almost \$11,000 was saved on MQM-107D landings. This totaled more than \$290,000. Annual projected cost savings will total more than \$986,000.

This success story demonstrates significant benefits can be realized by putting your ideas to the test and using a proven, structured problem-solving approach to monitor and improve operations.

The cost savings and reduced cycle times on the improved drone recovery procedures will benefit the 475th WEG for years to come.

Coordinator: Col Raymond C. Wilcox

Elimination of Stock-Outs: A Team Approach

645th Medical Group Wright-Patterson AFB, OH

ELIMINATION OF STOCK-OUTS: A TEAM APPROACH 645th Medical Group Wright-Patterson AFB OH

An ongoing, long-term problem of out-of-stock medications had been simmering in the pharmacy for months. The problem resulted in frustration among the pharmacy staff, patients, medical center healthcare providers, and medical logistics personnel. Despite having a fully qualified pharmacy technician who spent his entire week ordering and stocking drugs, the pharmacy was unable to fill many patients' prescriptions. In March 1992, Capt Michael Spilker, Chief, Outpatient Pharmacy Services, determined it was time to fix this problem once and for all. To try to determine the scope of the problem, Capt Spilker began tracking the number of stockouts each day. A stockout occurs when the pharmacy does not have a drug and a patient presents a prescription at the pharmacy window for that drug. Capt Spilker chose stockouts as the metric because it represents the endpoint, or final outcome, of the restocking and inventory management process as a whole. Capt Spilker's initial review indicated the pharmacy experienced an average of 17 stockouts every day. To put this in terms of the ultimate customer, these 17 stockouts a day resulted in approximately 60 patients a day being given an "out label" or IOU and sent away without medication. Some patients come from as far as 300 miles away; they were not happy to be sent home without their medication! To the pharmacy, it was obvious the current process was broken. It wasted time, generated significant rework, and compromised the quality of patient care. By tracking the number of stockouts each day, Capt Spilker determined that improvements in the process were absolutely necessary.

After collecting data for two weeks, Capt Spilker informed medical supply that he was collecting data in an effort to gauge the performance of the supply process. Almost immediately, the pharmacy stockouts were reduced because of the emphasis placed by medical logistics on providing better service to pharmacy's patients. However, as with most broken processes, the gains were not sustainable. Once management's emphasis was placed elsewhere, the number of stockouts returned to its previous level. Pharmacy and medical logistics management had seen the same results with these "Band Aid" fixes at other medical treatment facilities. Jointly, they decided there had to be a better way to fix the problem.

Traditionally, medical logistics and the pharmacy, at best, have operated under a climate of mutual tolerance with an "Us versus Them" mentality that existed at Wright-Patterson Medical Center and still exists in medical treatment facilities throughout the Air Force. This atmosphere was perpetuated by the belief among medical logistics personnel that the "pharmacy's lack of planning should not constitute an emergency on our part." On the other hand, pharmacy personnel believed that "medical logistics could not provide us what we need when we need it." Therefore, when pharmacy first approached medical logistics with an opportunity for improvement, overcoming the "Us versus Them" mentality became the first hurdle; a paradigm shift was truly in order. Fortunately, the Quality Air Force (QAF) culture that existed at the 645th Medical Group facilitated the

process for improvement. Medical Logistics was operating under a philosophy of "satisfying the customer."

A fully trained pharmacy technician worked full-time to maintain the pharmacy's stockroom with an eight to ten day supply. The pharmacy technician would spend one full day each week ordering drugs for the stockroom using a paper shopping guide listing over 1200 pharmaceuticals (a list of all stocked items, their levels, and locations). The technician would then spend another full day stocking the shelves with the week's delivery. The remainder of the time, the technician ordered emergency walk-through requests to cover out-of-stock items. The pharmacy still experienced 17 stockouts per day. Pharmacy and medical logistics were frustrated with the inventory process and each other, which, in turn, contributed to a stressful environment for medical center staff and patients. Patients were not receiving medications in a timely manner. A paradigm shift in the inventory process was required. Medical logistics' operating motto of "Dedicated to Customer Support, Committed to Continuous Improvement" was about to be tested.

In July 1992, Capt Spilker approached Capt Odom, the Medical Supply Officer, about forming a process action team (PAT) to improve the process. Specifically, Capt Spilker wanted to achieve a goal of zero stockouts. This called for another paradigm shift. The Air Force logistics standard required a 95 percent fill rate. Medical logistics consistently maintained a 95 percent fill rate or higher. Therefore, medical logistics personnel believed they were doing a superb job and a zero stockout goal was not only unrealistic, but also unnecessary. Again, the QAF culture at the medical center enabled medical logistics personnel to allow the customer to define quality. In the customer's eyes, quality meant a zero stockout rate.

The PAT was formed and after several meetings, using QAF tools, it was decided to fundamentally change the entire process used for ordering and delivering pharmaceuticals (i.e., from the time an item is ordered until it is stocked on the pharmacy's shelves). It was decided that medical logistics personnel would work in the pharmacy to order and stock drugs. In preparation for the changes, pharmacy personnel set three-day stock levels for all items in the dispensing area and stockroom. The shopping guide was then reorganized to reflect these lower inventory levels. Handscribed labels were used to identify item locations. Shelf labels were made for each item with the nomenclature, stock number, and three-day level. Items with no backup in the stockroom had their labels placed under their location in the dispensing area so the supply technician could easily identify them.

An initial two-month trial conducted on items in the stockroom (which contained 75 percent of the pharmacy's line items) showed that the new process had drastically reduced pharmacy's stockouts from 17 to two-to-three per day! This success fueled the team's desire to further improve the process and to sustain the results. The process was then automated with barcode technology and expanded to the rest of the pharmacy. The new process operates as follows. When the pharmacy needs an item from the stockroom, the staff pull the entire three-day quantity, leaving an empty space on the shelf. At 1500 hours, Monday through Friday, a medical logistics technician scans each empty space in

the stockroom with a barcode reader. For items with no backup in the pharmacy stockroom, the technician scans the appropriate item whenever the shelf balance falls below the three-day level printed on the shelf tag. In either case, a three-day quantity is automatically ordered from medical logistics. In twenty minutes, the order is completed and the scanned information is loaded on to a disc which is then entered into medical logistics' computer for delivery the next morning -- making the process paperless up to this point. The medical logistics' computer prints an issue list which warehouse personnel use to prepare for delivery. At 0700 the next morning, a medical logistics technician begins delivery of the previous day's order. By 0830, the delivery is completed and all items have been checked off against the issue list. All exceptions are noted in an exception book and are reconciled within 24 hours.

The results of the PAT's efforts are truly impressive. For over a year, the number of stockouts each day have been reduced from an average of 17 to two-to-three per day. The pharmacy can manage three stockouts per day and give the patient the individual service required to ensure quality care is continued. By reducing the outpatient pharmacy operating inventory from an eight-to-ten day supply to a three-day supply, a \$200,000 reduction in shelf stock was achieved. In addition, virtually every item that goes on backorder is ordered the same day and received within 72 hours. The outpatient pharmacy also regained the use of its pharmacy technician who was spending all of his time on supply-related duties. Medical logistics was able to reduce the Defense Business Operation Fund (DBOF) (previously called Medical Dental Stock Fund) inventory by \$750,000. Consistent ordering patterns and the addition of the Prime Vendor Contract allows for this inventory reduction. Medical logistics and pharmacy have an improved, harmonious working relationship. Finally, the most important benefit is that patients are getting the drugs they need when they need them.

A paradigm shift occurred, the process was reengineered, and a metric was established to monitor continuous process improvement. Service to the patient, the ultimate customer, was improved. The stressful environment for pharmacy, providers, logistics, and patients was removed. The pharmacy realized a one-time inventory reduction of \$200,000 and medical logistics realized a one-time inventory reduction of \$750,000. Stockouts were reduced from 17 to two-to-three per day. Furthermore, the quality of patient care was dramatically improved.

Coordinator: Maj Denise M. Childress

Fire Control Improvement Process

18th Wing Kadena AB, Japan

FIRE CONTROL IMPROVEMENT PROCESS 18th Wing Kadena AB Japan

America has 66 F-15C/D fighter aircraft forward-based at the 18th Wing in Okinawa, Japan. The mission of the 18th Wing is "to provide dependable, integrated, deployable, forward-based airpower for the United States and allies." For the 18th Wing to maintain Air Superiority in the Pacific Theater, the maintenance complex must supply our pilots with reliable aircraft to ensure our Wing's ability to produce its primary product -- Airpower.

The following hypothetical scenario clearly demonstrates why we, as maintainers, must provide our pilots the best product possible.

At 1100 hours, a four-ship patrol of F-15C Eagles, call sign SHOGUN, are alerted by an E-3 Airborne Warning and Control System (AWACS) aircraft of intermittent radar contacts approximately 30 miles north of the Demilitarized Zone. SHOGUN 01, the four-ship flight lead, calls for the flight to turn 180 degrees on a northerly heading. At this time, SHOGUN 01 sets radar to search the airspace low and his wingman, SHOGUN 02, begins to search high. SHOGUN 03 is also searching high and his wingman, SHOGUN 04, is searching low. This will allow the four-ship to search, detect, and sanitize the airspace in front of them. SHOGUN 01 calls "clean low," informing AWACS that his radar is not picking up any contact low. SHOGUN 03 calls "clean high," informing AWACS that his radar is not picking up any contact high. SHOGUN 04 calls that he has two bogeys in a lead trail formation split 10 miles, and that the lead bogey is headed straight for them 55 miles out.

AWACS confirms and identifies the approaching aircraft as bandits. SHOGUN 01 calls "clean that group" and asks AWACS for bearing and range to the bandits. AWACS calls "bandits bearing 360 degrees, range 45 miles, low altitude." SHOGUN 04 replies that he has the same picture on his radar and he has also identified the aircraft as bandits using on board systems. SHOGUN 01 is now getting really frustrated at the lack of a good radar system, but eventually obtains radar contact on what he thinks is the lead bandit 35 miles off the nose of his aircraft. SHOGUN 01 communicates that he now has the bandit leader at an altitude of 5000 feet and signals for SHOGUN 01 and 02 to target the "leader" while SHOGUN 03 and 04 target the "trailer."

At 25 miles SHOGUN 01 calls for the flight to search and lock in the same piece of sky, meaning that the time to sanitize the airspace is over, and the time to kill has begun. SHOGUN 01 and 02 lock the leader and, as they do, the bandits begin a defensive maneuver. SHOGUN 03 and 04 are waiting to lock the "trailer" when they hear that the lead bandit is no longer coming head on towards the Eagles. Due to the "leader" maneuvering, the radar lock of SHOGUN 01 is broken, meaning that he is now unable to fire on the bandit. SHOGUN 03 and 04

lock on the "trailer" and SHOGUN 03 fires. SHOGUN 01 calls "clean" and requests a point out to the lead bandit. SHOGUN 02 replies "Splash leader! Splash leader!" informing SHOGUN 01 that SHOGUN 02 has destroyed the lead bandit.

SHOGUN 01 requests status of "trailer" and after a pause is informed by SHOGUN 03 that he has visual contact of his missile fusing on the bandit followed by the trail bandit cartwheeling into the ground. SHOGUN 01 calls "Splash two" and requests information on any further radar contacts. AWACS replies that the picture is clear and the Eagles can return to their Combat Air Patrol. For the remainder of the flight, SHOGUN 01 thinks of how lucky he was that he was not alone during this encounter. SHOGUN 01 cannot wait to debrief his squadron's maintenance personnel on how he could have lost his life due to an ineffective radar system!

An indicator of a wing's intermediate-level repair effectiveness is maintaining reliable aircraft systems. One measurement of aircraft system reliability is the number of Pilot Reported Discrepancies (PRDs) a system encounters during any given month. We identified the least reliable system as the Fire Control System.

In late February 1993, a Wing-level team was formed. The Operations Group is responsible for the organizational-level maintenance portion of the process and the Logistics Group is responsible for the intermediate-level maintenance portion. The Operations Group was represented by flight-line technicians assigned to each of the three Fighter Squadrons. The Maintenance Squadron assigned three members from the Avionics Shop to the team. The team was complete when "customer" representation, a pilot, was added. Just by forming the team we had already overcome a huge obstacle. Never before had technicians from the flight line and the Avionics Shop worked together to solve a problem of this magnitude. Typically, flight-line technicians blamed Avionics Shop technicians for not properly repairing the line replaceable units (LRUs) sent to the shop. Avionics Shop technicians blamed flight-line technicians for not properly isolating aircraft failures to the actual faulty LRU. We were not focusing on the root causes of our system failures and our customers, the pilots, were paying the price. During day-to-day training sorties, the price was reduced training effectiveness. During an actual combat situation, this price could be loss of aircraft and, most importantly, loss of our pilots lives.

To establish a baseline of the process we used data from the Core Automated Maintenance System (CAMS) from 1 Jan through 30 Apr 93, to develop a chart of the Fire Control System PRDs. After developing this chart, we realized that we were only looking at the number of PRD occurrences. This had little meaning unless the numbers could be weighed against total sortie hours. In other words, how often was the Fire Control System was failing based on the flying schedule. We divided the number of failures per month into the monthly sortie flying hours; this gave us the Mean Time Between Failure (MTBF). We decided to break the Fire Control System out into a Pareto Chart of the subsystems. We discovered that 58 percent of the PRDs were caused by the Radar System.

We identified eight LRUs that are in the Radar System and aircraft wiring as root causes of the problem. During the 1992 William Tell Competition, Kadena's aircraft did not encounter a single Radar System Code 3 PRD. We needed to discover what they had done to prepare the aircraft for the intense competition that they would encounter, and whether we could apply those same techniques to our everyday maintenance activities. The basic philosophy in preparing an aircraft for the William Tell Competition was in-depth preventive maintenance. We adopted that philosophy in our daily operations.

We developed a preventive maintenance plan that could be incorporated into the aircraft phase inspections. During aircraft phase inspections, the radar transmitter (011), the radar receiver (022), and the analog-to-digital radar data processor (039) would be removed from the aircraft and sent to the Avionics Shop. We developed preventative maintenance inspection procedures above and beyond what was called for in technical data and performed these procedures on the selected LRUs prior to testing these units for serviceability on the test bench. While the LRUs were in the shop for inspection, a complete inspection of all Radar System-related aircraft wiring and waveguides was performed. This action plan was tested on four aircraft in the 44th Fighter Squadron. We collected data on Radar System performance for three months before and after the aircraft went in for phase inspection and the results were tremendous. We improved the break rate of our test aircraft to 18 hours compared with 9.4 hours for the rest of the fleet. The success of our test program led to the Wing implementing the program in each of the Fighter Squadrons in December 1993.

We increased the reliability of the Fire Control System by 27 percent. The aircraft MTBF for the system increased from 7.4 hours to 10.1 hours. We also reduced the number of "could not duplicate the malfunction" maintenance corrective actions by 37 percent!

Due to the phase schedule, all our aircraft have not received the preventative maintenance procedure. We will continue to monitor system performance on a monthly basis to ensure our gains are held.

By improving the reliability of the Fire Control System, we provided our pilots with the tools necessary to maintain air superiority. We met our Wing goal of maintaining ready aircraft, munitions, and support equipment, which enables the Wing to support PACAF's goal of forging a fighting team second to none! In reality, we were supporting the Air Force Vision: Air Force People Building The World's Most Respected Air and Space Force . . . Global Power and Reach for America!

Coordinator: TSgt Mitchell A. Villanueva

Health Professions Officer Accession

Air Reserve Personnel
Center
Denver, CO and
HQ AFRES
Robins AFB, GA

HEALTH PROFESSIONS OFFICER ACCESSION (Team³) Air Reserve Personnel Center Denver CO & HQ AFRES Robins AFB GA

Working together, ordinary teams can perform extraordinary feats. They can improve commonly shared processes in uncommon ways, stretching themselves and their organizations as they scale the heights of excellence. Just such a team of teams, uniquely made up of elements of two separate organizations, is taming a once out-of-control bureaucratic monster. Unacceptable average flow times of 9 to 11 months within the health officer accession (commissioning) processes were threatening national readiness levels in critical wartime medical skills. Recruitment incentives intended to provide immediate monetary help in exchange for future service were so long in arriving that they lost their appeal. A committee of Air Force Reserve Medical Service had even assembled technical experts in response to Department of Defense demands for increased medical officer accessions. The committee met repeatedly and developed 32 recommendations; yet the average process time kept growing. This was a seemingly irreducible monster process with a life of its own and a lust for growth; whoever its customers were, they weren't happy.

Team³ originated from a sense of urgency shared by the many co-owners of this troublesome process. In the fall of 1990, Maj Gen Alan G. Sharp, Air Force Reserve Vice Commander, extended an offer to join forces to Col Joseph C. Ramsey, Jr., Commander of the Air Reserve Personnel Center, using total quality tools and principles. Team³ resulted. Since that time, this partnership in a QAF continuous improvement effort has cemented and enhanced the bonds between these two organizations. Beginning its analysis in early 1991, Team³ is a triangle formed by a steering committee and two supporting process action teams.

Team³'s strengths are found in vision, diversity, a willingness to accept personal responsibility for change, and planning for sustained incremental improvements (we now know this as "Kaizen"). This team of teams is also traveling the pathway of "Arete" (a Greek word describing ability to change vision into action), which Ronnie Lessem, in Total Quality Learning, describes as essential to a true quality culture -- a transformation where the energy for improvement springs from all levels equally. It goes beyond the plan-do-check-act Shewhart cycle. Arete springs from the core of an organization's essential being. When activated, it is where leader-vision-hope and doer-empowered action combine to result in continuing improvement. Arete fosters critical reflection, spontaneity, innovation and renewal, but tests these with systematic quality tools.

Team³'s Arete discoveries led it precisely along a now-clear developmental pathway. In becoming a world-class QAF continuous improvement team, Team³ followed the nine steps of Arete (noted below).

Envision the challenge. Those initiating, chartering, and empowering the elements of Team³ knew well the prior failures, inertia, multi-owner complexity, and legal obstacles -- but saw beyond them to a better way.

Entice others to become interested in the challenge. Team³'s initiators respected the drive for excellence found in the process co-owners; they invited and won a joint approach to solutions.

Enable participants through education and understanding. Both ARPC and AFRES provided training to team members with an array of quality tools, principles, and expert facilitators. Team³ was fully empowered.

Engage participants to create partnerships and outside alliances. An initial steering committee, formed to explore options, elected to form subteams at each location. Worker-level input was the main target of this approach, which led directly to a breakthrough in defining customer requirements. Benchmarking activity soon followed, as did alliance with both military and civilian organizations.

Embrace the cause as a team. After the embarrassment of having worker input correct assumptions of officer leaders, Team³'s steering committee began to form and bond internally, seeing now with improved vision.

Empower the team to action. Command leadership actively encouraged Team³ on both sides, committing to approve data-driven recommendations founded on QAF principles.

Employ the team in action. After the formation of subprocess teams, creation of a joint process flow chart, and development of a plan for creating baseline data, action steps soon emerged and were quickly enacted. The recruiting force was reorganized. Team actions include: joint checklists, entire courses of instruction, annual team objectives, customer update newsletter, joint processing guide, team and individual recognition, Most Valued Partner (MVP) customer excellence award, desk-level tracking, standardization, metrics with control charts, lowered waiver authority, inspection-free processing, and purchase of fax machines. Worker morale soared.

Enjoy the rewards. Once consensus baseline data was recorded and tracked, a positive trend revealed reduced errors, improved quality checking and 25 percent reduction in process time. Continued spin-off actions in response to causes identified led to more improvements. By the fall of 1993, a dramatic process time reduction of 50 percent had occurred. This led to national Department of Defense

and other Service recognition of Team³'s achievements. Current flow/duration data show a process of fewer than 110 days down from 280 days, with a projection of 90 days for September 1994. Another remarkable outcome -- medical officer manning levels shot up from mid-70%/low-80% to over 95% in unit and 99% in individual programs. The FY 93 production year (612) was the best year ever!

Envision new challenges. Team³ is being called upon to help create similar applications of cross-organizational CIP projects. Remaining challenges to consistently meeting customer requirements within the health officer accession process will fully engage Team³ for some time to come. Team members envision a one-day process, using human-intelligence computer software. Additional professional recognition came unexpectedly from a team of quality evaluators with the Japanese Union of Scientists and Engineers (JUSE) who were visiting Robins AFB, Georgia, in June 1992. When JUSE members coolly and with great reserve asked few questions about the status of quality efforts as briefed, the team leader asked if there were any other projects underway. When Team³'s project was verbally outlined, he asked if a flowchart and measurement tools had been developed, and if so, could his team see them. As the extensive flowchart and proposed measurement tools were stretched out over the conference table, the entire JUSE team sprung out of their chairs, hovering over the lengthy chart. They began talking excitedly among themselves in Japanese, pointing and asking questions about the use of data for decision-making. Stating that they were most struck by the unique, cross-organizational nature of this effort, they declared it the finest example of quality analysis they had seen on their visit to ten Air Force bases, Robins being their last stop.

Team³ has created a sustained, incremental, continuous, and world-class quality culture within itself and its subteams. It was not discouraged by setbacks, it embraced new team members, and it called for meetings only when needed. It strives on as it seeks to realize ever more challenging improvements. It frequently shares its increasing successes with customers, suppliers, and alliance organizations.

Team³ evolved from a "could we?" steering committee into a triad of supporting interactive "can do!" action teams, effecting incremental but now massive change. Its members remain in close contact with one another, building and sharing gains in other areas. They track process variables, monitoring to ensure sustained improvement.

Team³ thrives. Its values are now shared and employed successfully by other teams. This team of teams is now an integral part of the AFR and QAF culture, proud and shared success, but humbled in the knowledge that such is not possible without Kaizen, Arete, and a profound awareness of the thirst for excellence we find in one another.

Coordinator: Capt Keith W. Fletcher

Maintenance Continuous Improvement Program

133rd Maintenance Squadron St. Paul, MN

MAINTENANCE CONTINUOUS IMPROVEMENT PROGRAM (MCIP) 133d Maintenance Squadron St. Paul MN

The 133d Maintenance Squadron realized that continuous improvement is the key to a sound Total Quality program. A Process Action Team was chartered to design and implement a successful program for the 133d maintenance members. The team was cross-functional and used the Tuckman Model and brainstorming to achieve this goal. Several total quality concepts were used by the team to accomplish this task.

The charter established the following: timeline, process owner, expectations, and parameters. It also set the stage for the process action team.

The cross-functional team was selected from volunteers. Average time in the Guard was 13 years and all branches of the Maintenance Squadron were represented.

Quality concepts of brainstorming, tools and techniques, facilitated meetings, and continual education of these concepts helped the team accomplish this project.

Continuous improvement is a key aspect for Total Quality and has been incorporated in the Maintenance Squadron with a sound charter, cross-functional teams, and education of quality concepts. The Maintenance Continuous Improvement program is a success and is a benchmark for the 133d Airlift Wing.

Coordinator: Maj James T. Daugherty

March Travel Section

722nd Air Refueling Wing March AFB, CA

MARCH TRAVEL SECTION 722d Air Refueling Wing March AFB CA

Proud people committed to providing world-class quality financial services and support to all customers -- Anytime, Anywhere!

In August 1993, the March AFB Travel Section assumed Norton AFB as an agent office. Although we had numerous meetings and coordinated with our Norton AFB counterparts, we did not fully realize the magnitude of the Norton AFB transfer until it actually took place. At this time, the Travel Section had five computer work stations. Of these five work stations, only four were available during normal customer service hours for computing and auditing. There were 11 people assigned in Travel Computation; three were fully trained with the remaining eight were in training. As of 1 August, our workload increased from 75-125 vouchers per day to 250-275 vouchers per day. We had to go from a volunteer status to man our swingshift to a nonvolunteer status in order to keep up with the workload, keeping in mind quality, timeliness, and efficient customer service. The Travel Section's reputation began to fall which did not only effect Travel. The base populace was forming a general impression of the entire Comptroller Squadron based on their experience with the Travel Section. Issues were being elevated to high management on a weekly basis, and there was hostility in the customers we served. At this time we knew our biggest challenge was to turn the Travel Section around in order to meet our mission goals.

PEOPLE

- Payment Timeliness -- established goal of 2.5 days
- Quality of Customer Service -- measured by customer service surveys
- Customer Service Counter Manning -- counter manned by two customer service technicians versus one

IMPROVEMENTS

- Revised process flow to meet the 2.5-day goal for processing travel vouchers
- Went from a numbering system to a sign-in log in the Customer Service area to measure customer waiting time
- Accuracy measured by AMC goal of 90 percent
- Continued meeting periodically with the team members as an informal working group to discuss any new issues, concerns, or suggestions
- Implemented Electronic Funds Transfer to expedite payment receipt time

PREPARATION

- Three additional computer work stations were added to the Travel Section
- Revamped the customer service counter to provide a work environment more conducive to one-on-one contact with customer
- Scheduled attendance for the "Teams and Tools" Quality Training course for Customer Service and Travel Computation personnel to expand overall knowledge

PARTICIPATION

- Broaden the base of technical knowledge within the Travel Section
- Impact of Quality of Training will be measured daily by preaudits and monthly by postaudit findings on travel vouchers
- Quality of the Finance Customer Service Guide will be measured through an analysis of the Voucher Reject surveys
- Initiated a publicity campaign to expand overall customer awareness to latest entitlement information

Coordinator: Lt Col Christopher P. Moore

Operating Room Orthopedic Tray

59th Medical Wing (Wilford Hall Medical Center) Lackland AFB, TX

OPERATING ROOM ORTHOPEDIC TRAY

59th Medical Wing (Wilford Hall Medical Center) Lackland AFB TX

Wilford Hall Medical Center's management style is changing. In August 1992, a problem in the operating room was identified by a customer. This customer identified problems with dirty, missing, and non-functional instruments in instrument trays. These instruments are used daily to perform surgery on patients with physical maladies. Instrument trays contain an average of two hundred instruments, and our instrument work room processes over 5,500 instrument trays a month. Concerned with customer satisfaction, a process action team was formed known as "TRAYPAT."

"TRAYPAT" began with an education process. We learned a new concept with Total Quality Management. Our education path led us to guide our team through the following process and its concepts of improving quality:

Find a process to improve.

Organize a team that knows the process.

Clarify current knowledge of the process.

Uncover the causes of process variation and poor quality.

Start the "Plan-Do-Check-Act" cycle.

Plan the process improvement.

Do the improvement, data collection, and analysis.

Check the results and lessons learned.

Act to hold the gain; adopt, adjust, or abandon the change.

By using the above process as a guide, we began our journey through Total Quality Management.

Our opportunity statement provided key boundaries for this process. The boundaries begin with dirty orthopedic instruments on a tray and end with the return of clean instruments in the operating room for the next surgical procedure. Problems noted were as follow:

- Instrument trays, when opened in the operating room, are incomplete for some surgical procedures.
- Patients spend longer periods under anesthesia than necessary.
- Support teams are not oriented to all phases of surgical tray preparation.
- Delays are incurred when incorrect instruments are placed in the trays, this impacts operating room utilization.

We used flowcharting, data collection, Pareto analysis, check sheets, cause and effect diagrams, and other methods to gather all the information necessary to solve our instrument problem.

Analysis of the data collected identified eight key areas that were responsible for our instrument problems. We discovered that our technician training program was deficient, workstations were inadequate, acquisition of instruments was poor, identification of broken instruments was non-existent, cleaning capabilities for instruments were lacking, dirty cart loading procedures were incorrect, a tremendous excess of unneeded instruments exist, and preventative maintenance for instruments was not being conducted.

Solutions to these problems were acquired through brainstorming, customer surveys, interviews with workers at all levels, internal and external customer ideas, and the experience and knowledge level of the team itself.

Clarification of our problems resulted in the following implemented solutions.

- Since our training program was deficient, we developed a 35mm video on instrument cleaning. In-services were given by physicians on the proper handling and care of instruments.
- Main workstations were modernized and relocated to improve human resources.
- Telephones were reconfigured and additional lines were installed to provide a speedy response for instrument requests.
- In addition, a rapid response instrument cabinet was created to provide immediate access to more than 40 of the most commonly used instruments.
- A cold water washer sterilizer was acquired from an external customer at no cost through a base closure. This washer enables instruments to be more efficiently cleaned.
- A toothbrush was added to trays to aid the technician in post-case cleaning.
- Cart-loading procedures were demonstrated to all technicians to aid in better handling of instruments.
- Hundreds of thousands of dollars were saved by eliminating excess instrumentation. We traded old, unused instrument systems dollar for dollar with different companies and acquired new state-of-the-art systems. One trade of unused instruments netted \$53,000 worth of joint prostheses used by surgeons to correct severe arthritic conditions in knees. We expanded our services to include other members in the Department of Defense. We actively sought a customer for an unused instrument system through a local company representative. This instrument system, valued at \$60,000, was shipped to a Naval Medical Center in San Diego.
- Other significant changes included placing a blue repair tag on instruments that were unserviceable. These tags are provided at no charge by our instrument repair contractor.
- A preventative maintenance schedule was implemented to keep instruments sharp, functioning, and always in use.

Post-data collection has demonstrated the effectiveness of the above changes. These changes resulted in a savings of 73 person hours per month with regards to processing instruments. Further data collection in the fall will identify if we are still holding these gains.

As a result of this process action team, instrument trays opened in the operating room are now complete. Patients spend less time under anesthesia, support teams are well trained in all phases of surgical tray preparation, delays waiting for instruments have been significantly reduced, and operating room utilization has increased.

Coordinator: Lt Col Donna M. Stone

Quality Idea Program

89th Airlift Wing Andrews AFB, MD

QUALITY IDEA PROGRAM 89th Airlift Wing Andrews AFB MD

"Put it on an AF Form 1000," "Call somebody who cares," "It's the military way," were the common answers given to people who came up with ideas and recommendations on how to improve procedures and processes utilized in our day-to-day operations. Statements such as, "If Uncle Sam wanted your opinion, he would have asked for it" were the usual order of business. This attitude is no longer acceptable during this era of reduced dollars and manpower. The phrase of choice is no longer, "If it ain't broke, don't fix it," rather it is "If it ain't broke, IMPROVE IT!" Such was the mindset when the 89th Airlift Wing decided to improve on its Quality Idea Program.

The wing commander established the Quality Idea Program to provide a medium for the unit's internal customers to recommend improvements to processes owned by the wing in order to aid in opening lines of communication and to improve the wing's quality movement. Members of the 1st Airlift Squadron, Andrews Air Force Base, Maryland, initially conceived this program to provide a tool for their personnel to submit ideas for improving squadron-owned processes. The program reaped many benefits. No tracking system existed, however, and it was limited to the 1st Airlift Squadron's personnel and processes.

After the 89th Military Airlift Wing and the 1776th Air Base Wing combined to form the 89th Airlift Wing (AMC), the quality office was created. One of its first projects was to expand and refine the Quality Idea Program for wing-wide implementation. One person was assigned to manage the program.

Realizing the Air Force already had the Suggestion Program for submitting ideas, parameters had to be developed to determine which program should handle ideas. That decision fell to the squadron commanders, and the Suggestion and Quality Idea Program managers. The 89th Airlift Wing commander assumed process ownership since ideas could originate from virtually every squadron under his command. The newly formed 89 AW Quality Council, consisting of the wing and vice wing commanders, group commanders, senior enlisted advisor, and the chief of civilian personnel, reviewed the program. They appointed a committee to brainstorm and flowchart a proposed process. After a few months, the 89th Airlift Wing Quality Idea Program was introduced to the wing quality council. The council approved the process and directed an evaluation of the program in June 1993. The Quality Idea Program manager briefed the purpose and attributes of the program to all group and squadron commanders, briefed at commander's calls and squadron and group quality council meetings, and advertised in the base newspaper to educate all wing internal customers. Copies of the flow chart, guidelines, and local forms were distributed throughout the 89th Airlift Wing. The 89th Communications Group developed a computerized tracking system which immensely aided the quality office in developing metrics. The metrics provided statistical data on the number of ideas submitted by groups during a given time frame, number approved, number referred to the Suggestion Program, and number of days it took to evaluate a quality idea. Once these metrics were established and tested, the Quality Idea Program went into full swing.

By December 1992, less than one year after its inception, a total of 505 ideas had been submitted. Of those, 215 were approved for implementation, 80 were disapproved, 61 were either already in use or were duplicate ideas, 53 were referred to the Suggestion Program, and 96 were still being evaluated.

We developed a certificate to recognize and reward people whose ideas were approved and implemented. The squadron commander signs the certificates and presents them at commanders' calls or other appropriate functions. The 89 AW Quality Advisor presented a consolidated package on the 89th Airlift Wing Quality Idea Program at the 21st Air Force Quality Conference, 12-14 October 1992, the 1993 Air Mobility Command Quality Advisors Conference, and the 1993 Air Force Quality Center Quality Advisors Conference. More than 20 bases worldwide requested more information on the program. We are not sure how many bases benchmarked our program, however, we did receive correspondence from the 133rd CAMS of the Minnesota Air National Guard, clearly stating how their program reached its objectives using the 89th Airlift Wing's program as a benchmark.

As with all new programs, flaws surfaced. Some ideas were late or lost because they had to pass through so many hands. Some submitters did not know how to ascertain the status of their ideas. The net result was that base personnel began to lose interest.

In June 1993, a team met to review the program. The five groups of the 89th Airlift Wing were represented. The team consisted of a squadron commander (representing the evaluators and approving side of the process), four group quality advisors, two submitters from two different squadrons, a newcomer to the base, a squadron point of contact, and the Wing Quality Idea Program manager. The review team met and identified several problems which required more extensive evaluation. As a result, the wing commander chartered a process action team (PAT). The team used brainstorming, flow charting, a cause and effect diagram, historical records, surveys, and metrics as tools for analyzing the process and developing imnprovements. The team targeted the Quality Idea Program's administrative process. They developed a survey to validate data under consideration by the PAT. The information gained from the survey and work center visits provided the team valid answers to many of the problems. Eight hundred people in the 89th Airlift Wing, representing all five groups, participated. Four teams were assigned to go to different workplaces to speak and get opinions on the Quality Idea Program.

The team compared flow charts of the intended flow process to the actual flow process. There was a drastic contrast between the two. Numerous changes to the original process (e.g., some squadron commanders adding points of contact to intercept and route the Quality Ideas) had occurred; little was standardized throughout the wing. For the points of contact, it was an additional duty with a low priority. Poor communication and confusion was the result. A tree diagram depicted proposed improvement areas for the Quality Idea Program. The primary question was, "What do we have to do to improve the Quality Idea Program?" Our narrative indicates the steps taken to answer this question.

Coordinator: GS-7 Theresa (Terry) A. Palmer

Reengineering the AF Medical Inspection Process

HQ AFIA/SG Kirtland AFB, NM

RE-ENGINEERING THE AF MEDICAL INSPECTION PROCESS HQ AFIA/SG Kirtland AFB NM

Once upon a time, in the land of Medical Inspection, There resided several processes requiring reinvention.

Dissatisfied customers demanded immediate change, Raising voices as one, they caused quite a few pains.

What our customers expected was unknown to us, So the first thing to do was find what caused the fuss.

By surveying customer needs, we found a big surprise, They wanted better reports and a much improved guide.

Hence, the metamorphosis of medical inspections began, The reengineering of our processes currently well in hand!

In August 1993, the Directorate of Medical Inspection at the Air Force Inspection Agency (AFIA) began a significant transformation which impacts Air Force medical treatment facilities around the world.

Feedback from Air Staff, MAJCOM Surgeon Generals' offices, and Air Force medical units indicated growing discontentment with Health Services Inspection (HSI) reports and with an 18-page HSI Guide. The 1992 HSI Guide included an 800-page checklist, and comments that the guide was "vague" and provided "no direction" were common on Air Force IG Post-Inspection Surveys returned by inspected units. Senior medical leaders, responding to an external customer survey, revealed HSI reports were rarely used to oversee subordinate units.

External customers wanted an accurate and objective medical inspection, and a scoring and reporting process based on specific and publicized evaluation criteria which would provide a road map for improvement. Customers also expressed a desire for increased staff assistance.

After determining customer needs and expectations and considering AFIA's quest to become "a world-class consultant in demand by Air Force leaders," three processes owned by the Directorate of Medical Inspection were prioritized for improvement: the Health Services Inspection Guide, the methodology used to conduct inspections, and inspection scoring and reporting. Medical IG members, who perform inspections of active duty Air Force medical treatment facilities, constituted the natural working group tasked to reengineer the medical inspection system.

Improvement design concepts were briefed to the Air Force Surgeon General, the Air Force Inspector General (TIG), and the Commander of the Air Force Inspection Agency in November and December 1993. Reengineering efforts were facilitated when a request to postpone all active duty HSIs scheduled in February and March 1994 was approved by the AFIA Commander, TIG, and Surgeon General. With such action indicative of the resounding support and encouragement received from higher authorities, the transformation of medical inspection and reporting processes began in earnest.

The decision was made to create an entirely new Health Services Assessment Guide which "married" Quality Air Force Criteria, national patient care and medical practice standards defined by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and other professional medical organizations, Air Force directives, and medically related regulatory requirements. To accomplish this task, ad hoc working groups were formed to develop the format and evaluation criteria for each of 11 Assessment Guide categories: Leadership and Executive Management, Process Improvement Activities, Information Management and Analysis, Human Resource Utilization and Development, Customer Focus and Satisfaction, Readiness, Preventive Health Services, Multidisciplinary Health Care Services, Diagnostics/Special Environments and Special Treatment Modalities, Health Care Support, and Other (Aeromedical Staging Facilities, Clinical Investigation Activities, Aerospace Physiology Training Unit).

The Medical Inspection Directorate sponsored a one-week conference in January 1994 attended by 11 individuals representing Air Staff and MAJCOM senior leaders. During this "Senior Medical Leader Focus Group" meeting, Assessment Guide design concepts were validated and work on evaluation criteria began.

In February 1994, three members of the medical IG team completed the three-week JCAHO surveyor course and used that opportunity to benchmark proposed changes in the Air Force medical inspection processes. Upon their return, medical IG team members were provided updates in JCAHO standards and briefed on JCAHO survey procedures during formal classroom instruction. Responses were so favorable to the initial training that classes were introduced to provide role-playing practice in refining interviewing skills and group facilitation. A computer group was also formed in February to produce an automated medical inspection scoring and reporting system.

The first draft of the Health Services Assessment Guide was completed in February 1994 and distributed to all MAJCOMs, members of Air Staff, and the executive staffs of eight volunteer active duty medical treatment facilities for input. New "protocols," or procedures, for conducting medical inspections were completed in March 1994. Alpha tests of both products were performed during on-site visits to the hospitals at Kirtland, Cannon, and Holloman that same month. Feedback from senior leaders and sampled medical treatment facilities, although generally very positive, resulted in an extensive revision of the Assessment Guide and protocols.

Beta tests of the revisions were conducted in April 1994 during routinely scheduled Health Services Inspections at Moody, Vandenburg, Elmendorf, and Eielson. An Air Force computer programmer accompanied the team to Alaska on a directorate-sponsored TDY to gain first-hand knowledge of supplier requirements for a computerized medical inspection scoring and reporting program. In addition, the AFIA Commander observed new medical IG processes at Moody, and the AFIA Vice-Commander joined the HSI team at Vandenburg. Once again, medical facility staff members were extremely enthusiastic and supportive of proposed changes and provided considerable input for revisions.

In May 1994, the new Health Services Assessment Guide, protocols, and a temporary automated reporting system were successfully deployed during a medical inspection of Wilford Hall Medical Center. Nineteen medical IG team augmentees received training in the new processes immediately prior to the inspection and adapted well to changed procedures.

Coordinator: Lt Col Terri Page

Refurbishment

433rd Equipment Maintenance Squadron Kelly AFB, TX

REFURBISHMENT 433d Equipment Maintenance Squadron Kelly AFB TX

On 12 March 1993, the 433d Logistics Group Commander notified the 433d Equipment Maintenance Squadron that there was dissatisfaction with the conditions of our fleet of aircraft in relation to refurbishment. This included not only the 16 C-5A aircraft assigned to the 433d Airlift Wing Kelly AFB, Texas, but also the 16 C-5A aircraft assigned to the 439th Airlift Wing at Westover AFB, Massachusetts. A tasking was given to develop and be ready to implement a solution to this problem by 30 March 1993, which was only two weeks away. A time frame of six months was given to refurbish 18 C-5A aircraft. The time frame for normal refurbishment flow was only adequate to perform six C-5A aircraft refurbishments.

The Equipment Maintenance Squadron immediately formed a process action team consisting of six supervisors who were stakeholders and actually owned the process. An immediate "as is" and "desired statement" was accomplished to focus on the issue at hand.

Process action of the problem began with a cause and effect analysis to ensure prioritization of the numerous seemingly overwhelming problems. Pie charts were then developed to identify and analyze the manning problems being faced by the team in the areas of number of employees, shifts to be worked, and day of the week assignments. Flow charts were also developed to address the time constraints faced; normal refurbishment flow was to be compressed from 45 calendar days to 18 calendar days. Specific day-to-day flow schedules were developed to ensure process capability. Gantt charts were utilized to simplify and clarify actual process capability on a daily basis. The cause and effect analysis led to four major areas of concern. Problem solving began in those identified areas of funding, manning, equipment, and facilities. Process improvement efforts using the quality improvement process slowly began to overcome all obstacles identified. The team identified the process to be completed by breaking the process down into minute tasks to be performed. This led to a better understanding of the manning and equipment required for process improvement.

Weighted voting was used as a tool to expedite the improvement of the process due to time constraints which were an overriding factor in mission accomplishment. Internal and external suppliers were identified by the team to ensure process improvement was compatible with their ability to support the process. The team realigned, improved, established, and committed all resources necessary for process improvement.

The process action team combined 250 employees from 22 different specialties into a cohesive work force. The training required prior to work force production efforts was accomplished in minimal time due to early identification of that training, with the use of the quality improvement process. These employees were assigned to 24-hour-a-day coverage, 7 days a week.

The process action team developed an 18 day aircraft flow plan. This plan enabled the employees empowered in the process to refurbish 18 aircraft in a six-month period.

The process action team identified and contacted all of its customers to ensure the process was meeting the customer requirements and not the team's interpretation of those requirements. The team prioritized the processes requiring immediate attention and those requiring process improvement.

With the use of the quality tools, the team identified and prioritized the use of facilities and the short-fall of equipment required. These were key factors in the process improvement's success. The tools used were identified early in the process team's charter. This allowed for the necessary coordination and procurement of additional equipment and effective use of existing facilities.

The team developed customer satisfaction surveys which provided direct customer feedback during the process. This enabled the team to continuously and immediately improve the process to gain total mission accomplishment. Customer feedback gave the team a means to identify early in the process if a failure to meet customer requirements existed and thereby to change the process on a continuous basis to meet those requirements.

The team's identification of shortfalls of material, from outside suppliers through surveys of these suppliers prior to implementation of the process improvement plan, led to the contingency plan of locally manufacturing the materials. The process allowed early identification of this problem and its solution.

Upon completion, the process improvement plan was presented to the stakeholders, process owners, and customers which led to early "buy in" and consensus of the plan. This led to continuous improvement efforts in a true team effort by those individuals.

The quality improvement plan implemented was continuously improved, modified, and streamlined to meet customer requirements: 18 C 5-A aircraft refurbished in five months and two weeks, under budget. The Aircraft Maintenance Unit Effectiveness Award was presented to the 433d Airlift Wing Equipment Maintenance Squadron in recognition of this overall quality team effort. Furthermore, 62 individual Air Force Achievement Medals were given as a direct result of the quality improvement process implemented. These individual Achievement Medals were the result of team nominations of five to six members per team. The success of the quality improvement team was publicized in the "Alamo Wing News Letter," "Kelly Observer," "Airman Magazine," and "The Citizen Airman Magazine." This tasking had never been undertaken by any Air Force Reserve or active duty unit before. Failure was certain under the old paradigms. Our formula for success was the quality improvement process, without which customer satisfaction, employee buy-in, and supplier efforts could not have been achieved.

Coordinator: Maj Elizabeth Z. Anderson

"The Team," Programs and Engineering Section

50th Logistics Support Squadron Falcon AFB, CO

"THE TEAM," PROGRAMS AND ENGINEERING SECTION 50th Logistics Support Squadron Falcon AFB CO

The 50th Logistics Support Squadron (50 LSS) is the logistics manager of communications and computers for the Global Positioning System (GPS), Defense Meteorological Satellite Program (DMSP), and the \$6.2B Air Force Satellite Control Network (AFSCN). The squadron analyzes maintenance needs, manages supply and transportation support, writes and administers contracts, and develops and implements communications-computer architectures and security plans. The Programs and Engineering Section (50 LSS/LXCP) provides technical expertise in the acquisition, implementation, and life-cycle management of Command, Control, Communications, and Computer (C4) systems through planning, requirements processing, engineering, and program management. Customers identified include: all 50 LSS offices, 50 SW and Falcon tenant units, Orderly Room, 21 SW, HQ AFSPC, CSC, SSC, AFTCO, AFC4A, DISA, DECCO, and the Engineering & Installation (E&I) community, among others.

The Team was commissioned to develop a strategic plan for the section for several reasons: (1) to further nurture a customer-focused attitude, (2) to encourage team building, (3) to set a common path for everyone to pull together, (4) to increase cooperation and pride, but, most importantly, (5) to deliver the quality products and services our customers desire and deserve.

The Team composition was the entire 50 LSS/LXCP section (thirteen personnel). This included ranks from Airman to Captain and drew from several professions. We felt it was crucial that every member of our section play a role in developing the strategic plan both for their invaluable insight and expertise and to establish a "buy in" from the beginning. The Team was fortunate to have a fully trained and experienced facilitator present at all times. Since the entire team came from the same section, excellent group cohesion was already present. Individual techniques and tools were explained and demonstrated by the facilitator as they were needed in a just-in-time method.

The Team was empowered 100 percent by its charter, the section chief, and flight chief. Senior leaders at the Wing, Group, and Squadron levels totally supported the Team, allotted sufficient duty time and excellent facilities for an off-site session, provided ample supplies (including a laptop computer for recording notes), and fully supported the Team's recommendations/findings.

Due to our organizational empowerment principles, we (the Team) truly owned the processes we were studying and improving. We were the technical experts of our processes and we would live with the consequences of our changes.

The primary tool/method used by the Team to define the process and identify its boundaries was the Berry Unit-Level Quality Planning Model which is a "how to" version of Dr. Shewart's original Plan-Do-Check-Act Model. A milestone chart was established and strictly followed. The Team utilized brainstorming techniques, tally sheets, pareto charts, pairwise ranking, and multivoting. The Team's mission statement was, "Develop a strategic plan (unit quality plan) for 50 LSS/LXCP. Research and analyze key processes, business practices, customers, products, and services in an effort to improve existing office processes." The end result was a 36-page strategic plan which includes many targets for improvement and specific steps to achieve them. The tables identify what actions are necessary, which personnel responsible, and the resources required. Individuals identified as personnel responsible took their action items from the overall section action plan and began to implement them into our daily processes.

Customer satisfaction was determined the old fashioned way - by talking to our customers. Our primary tools for determining customer satisfaction were the interview and survey.

Our requirements process previously included a database which meticulously tracked date of receipt, steps toward completion with dates and focal points for those steps, and dates of completion and return to the customer. Between this database and our paper filing system, we were able to accurately calculate many valuable data sets. Brainstorming provided many ideas on areas for improvement. We grouped similar ideas and used a multivoting technique to rank order those ideas. The most significant improvement opportunity identified was to reduce the number of incoming requirements documents. Our overall number of requirements documents received has been reduced by over 25 percent by one idea only.

The Team utilized cause and effect methods to define targets for improvements and depicted them in cause and effect (Ishikawa) diagrams. This allowed the Team to focus its energies on potential root cause of the target for improvement. Two primary tools were used by the Team to determine possible root causes: cause and effect diagrams and the "Five Whys" tool.

To help reduce our CSRD processing times, we took into consideration several factors including: (1) cost effectiveness, (2) political feasibility, (3) time to implement, (4) overall effectiveness to help solve our problem, and (5) likelihood of occurrence.

Each specific action planned had at least one associated quality indicator such as number of days for processing, number of rejected forms, number of missed C4 installation dates, and so forth. These indicators are currently being tracked to show our progression toward our goals.

We were fortunate to have a good mix of process-oriented and task team members. Each of these roles made invaluable contributions toward the Team's success. The action plan developed includes specific improvement actions, and each of these was directly tied to a specific person responsible for its implementation.

The Team communicated its improvements via articles in the base newspaper, electronic mail messages, electronic bulletin board notices, customer education guides, new wing and base regulations, and customer training sessions conducted by the Team. The final product was distributed throughout the base and copies were sent to our MAJCOM counterparts so that other offices might benefit from our success story. The effort was publicized in the local newspaper and briefed to the Wing Quality Council.

The entire Team took great pride when articles were published in the base paper, Falcon Feedback. On 23 June 1994, we were selected to represent the 50 SW in the 1994 Chief of Staff Team Quality Award competition and were awarded plaques and certificates. On 11 July 1994, we were selected as an AFSPC 1994 Team Quality Award winner to represent the command at the Air Force level. Our command recognized each member's dedication with a medallion.

The original plan included a section for periodic review and analysis of progress by the Team on a semi-annual basis. The first of these review sessions, in June 1994, resulted in an assessment report and an updated strategic plan. We firmly believe the old adage, "Quality is a journey and not a destination."

The semi-annual team review sessions were designed to evaluate and tackle remaining problems and new problem areas, and to monitor the success of the Team's action plan. We intend to extend the CSRD waiver to other requirements such as standard desktop computers, fax machines, and answering machines.

We are still evaluating the overall effectiveness by collecting data from our processes and customers. We view this entire effort as a self-initiated grassroots-level quality effort to cultivate and harvest "low hanging fruit." We remain energized and excited, and gain strength, confidence, and momentum with every success. In our wildest dreams, we never anticipated harvesting so much fruit in so little time.

Coordinator: Lt Charleen E. Schilling

Tri-Wall Aerial Distribution System

352nd Special Operations Group Rhein-Mein AB, Germany

TRI-WALL AERIAL DISTRIBUTION SYSTEM 352nd Special Operations Group Rhein-Main AB Germany (Deployed)

The Tri-Wall Aerial Distribution System (TRIADS) team achieved their goals within the context of the Operation PROVIDE PROMISE effort to feed the refugees of Bosnia-Herzegovina (B-H). The mission, handed to the Chairman, Joint Chiefs of Staff (CJCS), by President Clinton, was to "... airdrop relief supplies to Bosnian war victims to supplement ground convoys that can't get to all areas of the war-torn region." The TRIADS team consisted of members of the 352d Special Operations Group deployed to Rhein-Main Air Base (AB) Germany. The 352d's role (through the 7th Special Operations Squadron [SOS]) in the operation was to provide the low-altitude, precision airdrop of supplies to areas without adequate drop zones nearby for the high-altitude bundle drops conducted by the 435th Airlift Wing (AW). The ultimate customer was the Bosnian refugees in besieged towns such as Garazde, Zepa, and Srebrenica, who were without food and adequate medical care in a brutal climate during civil war. Those working to provide U.S. aid to these people included the airlift task force at Rhein-Main AB, Germany, under the command of Brig Gen Donald Loranger; the Joint Force Air Component Command (JFACC) at Ramstein AB, Germany, under the command of MGen Chambers; the Operation PROVIDE PROMISE Joint Task Force (JTF) at Stuttgart, Germany, under the command of Admiral Boorda; the U.S. European Command (USEUCOM) under the command of Gen John Shalikashvili, the UN High Commissioner for Refugees (UNHCR) in Geneva, Switzerland, the Chairman, Joint Chiefs of Staff, Gen Colin Powell; and the President of the United States.

The team's purpose was to find a survivable, reliable airdrop system to provide aid to the Bosnians. From the standpoint of the mission, the TRIADS teams efforts are a page out of the AFSOC Mission Area Plan for Foreign Internal Defense, where special operations forces survey and assess the host's situation, environment, constraints, capabilities, needs, and resources. The desire to conquer problems unconventionally, using common sense, ingenuity, and determination, is a tradition within Special Operations.

The JFACC Commander had to develop a way to supply the Bosnians with food without causing injuries or helping the Serbs. The national prestige of the United States was at stake pursuant to the President's commitment to an airdrop effort. Although high-altitude container delivery system (CDS) airdrops were working, there was considerable risk associated with the process due to the weight and speed of the bundles when they hit the ground. A mechanical malfunction or airborne miscalculation could send a bundle careening into a populated area, fatally injuring the occupants. This risk was increasing as the effort became more and more multinational, each nation contributing aircraft and aircrews with different training, techniques, and capabilities. Any difficulty with a combined mission would be the responsibility of the U.S. to explain and would jeopardize continued operations. There was another, subtle problem that challenged the team. Food arriving within besieged cities had to be fairly distributed. This was difficult to ensure with United Nations forces controlling the ground delivery process; it was impossible to ensure with airdropped supplies. Loss, hoarding, or confiscation by the Serbs

reduced the amount of food getting to those who needed it. Worse yet, people were shot while trying to recover Meals-Ready-to-Eat (MREs) dropped outside of the town. The solution to the problem required that the drops be conducted safely into populated areas with a guarantee that the food be fairly and evenly distributed.

The ultimate goal was to provide at least as many MREs as the CDS bundles but without the negative side effects. The customers' requirement for food was "as much as you can send." We examined the airdrop process, both high altitude and low level, in order to achieve the desired effect without the risk of exposing the aircraft to danger from hostile ground fire or injuring personnel on the ground. We soon focused on the problem of using the standard CDS rigging (normal for this type of airdrop) for the supplies. We examined the other types of rigging systems we used and evaluated the ability to modify them for this requirement. The team then brainstormed the problem for additional potential solutions and chose to adapt leaflet-scattering rigging techniques for distributing MREs. This rigging method appeared to have the greatest potential for success.

The project consisted of four phases: concept development, flight testing, marketing, and operational employment. The team used a briefing package to summarize all aspects of the process. The package contained the situation driving the process change, discussion of the CDS process, advantages of a free-fall system, specifics of the TRIAD proposal, and a recommendation for implementation. The only significantly different approach was to free-fall the meals. This led to modification of leaflet airdrop procedures and the TRIADS program. The tangible effects would be: increased safety, immediate distribution, and lower cost. Better safety was achieved because navigation and mechanical variables became less critical. Analysis of the meal pouches revealed that the irregular shape and large surface area helped reduce terminal velocity through tumbling and wind resistance, and the air trapped inside helped cushion the impact. Because the cardboard containers "explode" in the slipstream immediately after exit from the aircraft, meals are evenly distributed in a predictable oval pattern as they fall towards the earth. This footprint, and the density of the meals within it, can be controlled by varying drop altitude, the number of meals released, and the placement of the formation's release points (overlapping, adjoining, or collocated). Cost estimates for TRIADS indicated a cost savings of more than ninety percent over conventional CDS. Intangible benefits included: simplicity, universal application across a formation of dissimilar aircraft, unsuitability for heavy items, and psychological effect. Simplicity in design meant that the system would be very reliable and easy to teach to any interested party, flying any type of cargo aircraft, with or without a supply of proficient tactical airdrop crews. The system could not be used to drop weapons or ammunition, quieting the protest by Serbian authorities that the U.S. was surreptitiously arming the resistance. The psychological effect was threefold. On the international stage, it showed the relief effort as taking the initiative and deflated antagonists by removing their greatest opportunity for a propaganda coup (exploiting or even staging a drop into a city). Among the refugees, waking up and finding food laying in the street had to have an uplifting effect. The fights for food and lines at the truck could be forgotten for a while, replaced by an "easter-egg hunt" for MREs. For the crews flying the long missions out of Germany night after night, the initiation of a new airdrop method provided a little excitement to break the monotony.

Measurement of success relative to the political scene, which matched the long-term need of the Bosnian "customer," had to be the appearance that the airdrops were getting through, that they were not discriminate, and that they did not include weapons. The customer was indirectly accessible through the UNHCR observers. The clearest picture of their satisfaction came from newspaper reports originating from the besieged enclaves. Additional reports came from UN ground forces endeavoring to distribute food by truck. Gen Morillon, ground forces Commander, reported directly from Srebrenica. Television footage provided insights, such as the fights for food between children and elderly people at MRE distribution sites, as well as pictures of men and women foraging for food and firewood. Once TRIADS was implemented, the refugees were getting additional food and the distribution problem was solved.

Coordinator: Lt Col David C. Scott

Two-Level Maintenance Material Supportability

Oklahoma City Air Logistics Center Tinker, AFB, OK

TWO-LEVEL MAINTENANCE MATERIAL SUPPORTABILITY Oklahoma City Air Logistics Center Tinker AFB OK

The Air Force is undergoing a tremendous period of change, both at the depots and field organizations, with base closures, personnel downsizing, and new maintenance concepts. One of the biggest changes is the conversion from three levels of maintenance at organizational, intermediate, and depot, to two-levels of maintenance.

In March 1992, the Secretary of the Air Force directed the major operating commands to begin analyzing the feasibility of transferring jet engine repair that cannot be performed with the engine mounted on the aircraft wing, to the depot repair facilities. Under the proposed concept, engine repair that was being accomplished by the field units as Jet Engine Intermediate Maintenance (JEIM) would be moved from the flying units in the field to the depot.

Traditional depot overhaul of jet engines consists of complete disassembly, then cleaning and repair or replacement of component parts; parts are then assembled as a whole engine. Under two-level maintenance (2LM), the extent of repair or replacement of components will vary depending on what is required to return an engine to service. Workscope teams perform in-depth inspections and engines are disassembled only to the point necessary to accomplish needed repairs. Two-level maintenance also requires that engines be tested with Quick Engine Change (QEC) kits installed as they were in the JEIM shops in the field.

The Two-Level Maintenance Branch was formed within the Propulsion Directorate, Production Division, at Tinker AB in the fall of 1992. The function of the 2LM Branch is to facilitate the implementation of the new concept and validate pipeline time, cost, and engine customer support.

Initially, there was a great deal of apprehension by command customers over the possibility of failure to successfully implement the new procedures. They had been accomplishing this repair in their own shops and saw no reason to change. Organizational restructuring was required and new ways of doing business had to be implemented. Field units have become customers of the process they were accustomed to performing for themselves.

Procedural changes in the engine community were extensive and the field organizations as well as the depot were scrambling to implement them. Then, high-level policy decisions were made to move up the 2LM implementation schedule for some engines by one full year. This would not allow the depot the normal phase-in time needed to implement such drastic changes. Concurrent decisions to cut field unit manning levels and to target specific career fields, including engine skills, left units unable to guarantee adequate levels of spare engines to support their mission.

The 2LM Branch at Tinker chartered several Integrated Product Teams (IPT) to define and improve the processes required to produce engines under the 2LM concept. The Gold Team was chartered to evaluate procedures and implement changes required to reduce valuable time expended in obtaining material and parts.

Customers of the 2LM process agreed that maintaining serviceable engine Base Stock Levels (BSL) at 100 percent is the real "metric of success" for the 2LM concept. If the depot could maintain stock levels required by the operating commands to accomplish their missions, 2LM would be a success for all concerned and would have a positive impact on the Department of Defense effort to downsize and reduce costs.

Engine BSLs are one of the basic metrics tracked as a report card for customer support. Although the Gold Team developed several interim measures, the same metric was adopted as a measure of its overall success. The team recognized that the best way to accomplish their goal was to reduce the number of flow days required to process an engine through the 2LM shops by ensuring that parts and material are available and on site when the mechanics need them.

Under the existing material supportability procedures, BSLs on the TF33-7A were not being maintained at the required 100 percent. The 2LM shops at Tinker were unable to produce serviceable engines in a sufficient quantity that customers were guaranteed an engine would be available when they needed one.

The Gold Team is made up of the natural working group who are those functional experts from every aspect of the material ordering and receiving process. Members brought with them a cross-section of expertise and knowledge. They also brought enthusiasm for the task and a sincere desire to improve material support for the 2LM shops. One member of the team was a key player because he was not from the depot environment. He was a military shop supervisor who had been in charge of a Maintenance Operations Center in the field and brought a fresh perspective to the team.

Team members accomplished extensive research and analysis, working together to develop twelve recommendations for improvement of the process and implementing changes that were within the scope and authority of the team. As a result of these efforts, the following changes have already been implemented.

- A separate area has been designated and a security cage built to house parts and material that constitute bench stock for 2LM.
- The caged area on the shop floor has been designated as a separate delivery point in the
 engine overhaul facility for 2LM material. This prevents material from being co-mingled
 with other parts and supplies that are destined for other engine lines and significantly
 reduces delivery time.
- Desktop computers have been obtained and a database developed to provide easy access to information required for mechanics to order parts. The team could not identify a

database already in existence which met the needs of the mechanic. The centrally located bench stock was a new concept for 2LM and the database was built from the ground up with the mechanics directly involved in making it user friendly. The database is continually updated by clerks in the bench stock operation.

- Training has been accomplished to teach mechanics, schedulers, and parts expediters how to obtain required information from the database.
- The focus of the Gold Team has been on TF33-7A; however, their ideas have been crossfed to other 2LM engine lines.
- Team members continue to fine-tune those recommendations that have been implemented for further process improvement.

Some recommendations that cross organizational lines are still pending implementation. However, the greatest benefit to date is the reduction in the number of critical engine parts not available from 43 in December 1993 to five in July 1994.

As a result of team efforts, BSLs have been consistently maintained at 100 percent, providing field customers the engines to support mission requirements.

Working together in a team environment has given team members an opportunity to develop their interpersonal skills and experience the synergy of group dynamics. The coalescing of a formal team with scheduled team meetings has enhanced the day-to-day lines of communication in the process' natural working group.

Customer focus has also helped to open the lines of communication between the depot and the field units. Customer acceptance of 2LM has been greatly enhanced by the efforts of this and other IPT efforts at the depot.

Coordinator: GS-12 Jan Clark

Y-CORD Quality Improvement Team

552nd Air Control Wing Tinder AFB, OK

Y-CORD QUALITY IMPROVEMENT TEAM 552d Air Control Wing Tinker AFB OK

The 552d ACW Y-Cord Quality Improvement Team (QIT) was chartered in September 1993 to resolve a long-standing problem involving the communications process inherent to operating the E-3 Sentry Airborne Warning and Airborne Control System (AWACS) aircraft. The situation involved an operational/procedural need that exceeded the basic capability of the communications system of the aircraft itself.

The E-3 is configured with 14 control consoles from which surveillance operations and weapons directing take place. Each console is fitted with two communications jacks, enabling a primary operator and one observer to access the internal and external communications frequencies programmed for that console. It is through these communications jacks that operators establish vital voice contact with command and control agencies and aircraft external to the E-3, and with all other crew members internally. Unfortunately, two communications jacks are not always enough for thorough training/evaluation purposes. Many times a third communications jack is necessary as a result of instructor training and certification evaluation requirements.

The 552d ACW's two training squadrons continuously provide basic and advanced crew member training for 16 different positions. Part of that training process includes development of a qualified instructor force. Therefore, it is common to have a basic student, instructor trainee, and a master instructor at the same console, all accomplishing necessary training. Also, when instructor trainees receive their certification evaluation, evaluators comprise a third individual at the same console as they assess the instructor's ability to teach. Given these situations, three-deep communication capability at control consoles is essential. Without it, flight safety, situational awareness, and instruction and/or evaluation integrity may be markedly compromised.

Over the past 16 years, AWACS crews have creatively fashioned alternate types of communications cords to create three-deep communications. One option commonly used was a Y-cord, a modified communications cord with two headset jacks at one end and only one jack at the other end connecting it to the console communications panel. While Y-cords did enable three-deep communications, they also caused premature burnout of some electrical components by creating an impedance mismatch with the communications panel. As a result of this long-standing operational limitation, the 552d Operations Group Commander chartered the Y-Cord QIT to find a way to create three-deep communications at all E-3 consoles without damaging the equipment and for a minimal cost. By design, the team consisted of highly qualified instructor crew members and maintenance technicians well-versed in E-3 communications systems.

Clarifying the charter was fairly easy because the nature of the improvement opportunity was well defined: create an inexpensive three-deep communication capability. The team designed some basic ground rules for the manner in which its members would

relate and respond to each other, and for how the team would manage the flow of ideas it would undoubtedly generate.

Through the Nominal Group Technique of brainstorming, the team fashioned seven options for action. The team then evaluated the soundness of each option, completed cost comparisons and technical assessments, and created a solution selection matrix. Throughout its fact-finding phase the team conducted face-to-face surveys with many different crew members and maintenance technicians and collected valuable inputs and opinions - much needed customer feedback. Based on its research findings, the team deduced the communications cord adapter box to be the best option and fabricated a prototype that contained two sets of resistors to match impedance: microphone and headphone resistors.

The team tested the adapter box in two phases. In conjunction with engineers from the Oklahoma City and Warner Robins Air Logistics Centers, the team conducted tests on a static E-3 in November 1993. The initial tests revealed the need to remove the microphone resistors from the prototype, an action the engineers deemed acceptable, to increase the quality of audio reception. The headphone resistors in the box were all that were needed to correct the impedance mismatch created by the addition of a third headset on a communications panel. This test set the stage for the second phase: in-flight testing. Over six missions (about 50 flight hours), various crew members experimented with the adapter box. Customers raved about the utility of the adapter box and even recommended the team add a clip to the side of the box so users could attach it to their console or seat. The testing reconfirmed that the box appeared to be an outstanding solution to the problem. The team reported the results to the 552d OG Commander, who promptly endorsed fabrication of 30 boxes. Next, the team coordinated with the 552d Logistics Group sheet metal and communication-navigation technicians to set up a fabrication process.

Once all the necessary electrical components were procured and the bodies of the boxes shaped, a team of maintenance specialists from the LG and flying squadron maintenance units joined forces in creating an assembly operation to build the boxes. Thirty boxes were distributed among the 966th Airborne Air Control Squadron (the wing's dedicated flying training squadron) and the remaining three operational squadrons.

Fielding of the boxes has been very successful. Three-deep communication is now available at any console whenever needed. The adapter box enables instructors and evaluators to monitor their students' radio calls conveniently and continuously with absolutely no damage to the equipment.

The Y-Cord QIT is truly a quality success story. From inception to follow-up evaluation, the team applied quality concepts in exemplary fashion and solved a procedural problem that had plagued AWACS crews for more than a decade. The success of the Y-Cord QIT is just one more affirmation that the 552d Air Control Wing, and the rest of the

Air Force, cannot afford to overlook the fundamentals of Quality. There's too much to gain. Without question, Quality works!

Coordinator: Col Michael G. Vosmeier

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